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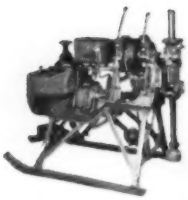
MINING WORLD

CATALOG, SURVEY & DIRECTORY NUMBER

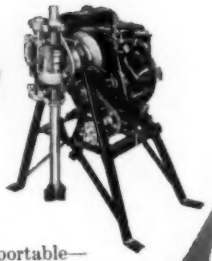
APRIL 15, 1957



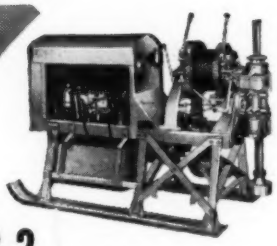
BBS-1

World's best known surface drill. Handles "E" Rods to 1,500 ft., "A" to 1,100 ft.

x-ray



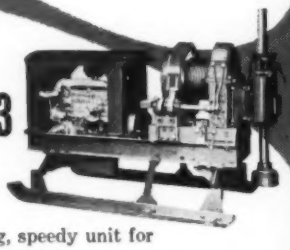
Compact, portable—185 lbs. net. Takes ¾" or ⅞" core to 200 ft. Low fuel consumption.



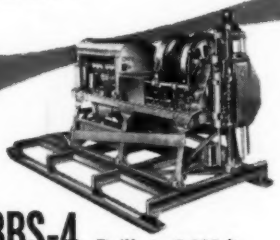
BBS-2

Versatile, choice of 5 swivelheads. Depths to 3,500 ft. Gas or diesel.

BBS-3



Strong, speedy unit for deep drilling . . . 4,600 ft. with "A" or "B" Rods, 95 h.p. diesel.

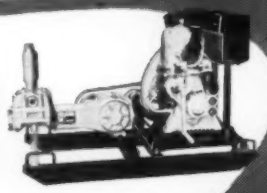


BBS-4

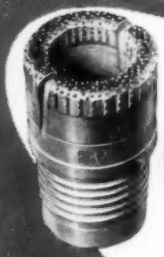
Drills to 5,000 ft. with "B" Rods. Moves under own power, gas or diesel.

if it's for diamond drilling we make it!

drill pumps



5-12 and 4-7 models. Capacities 400 to 1,200 g.p.h. Diesel motor optional.

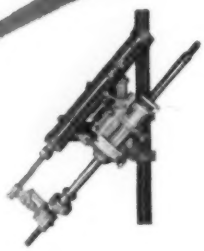


permaset bits

(Powdered metal)

All standard sizes available from stock. Also reaming shells, etc.

JV



4 feed swivelhead. Capacity 800 ft. with "E" Rods. JVR with right-hand feed screw for blastholes.

BBU-2

Rugged. Capacity 1,800 ft. with "E" Rods, 1,400 ft. with "A", four gear speeds.

VEG

Vane motored version of J.V. Lightweight, compact construction. Can be speedily dismantled into two units.

BOYLES BROS
DRILLING COMPANY LTD.
VANCOUVER, CANADA

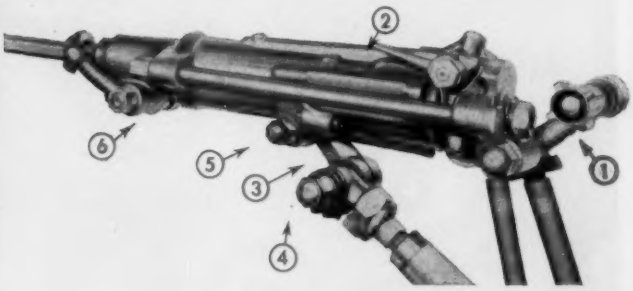
BOYLES BROS. (PTY) LTD., JOHANNESBURG, SOUTH AFRICA • BOYLES BROS. DRILLING CO. LTD., NEWCASTLE-ON-TYNE, ENGLAND • ATLANTIC, GULF AND PACIFIC CO. OF MANILA, PHILIPPINES • SHRIRO TRADING CO. S.A. TOKYO, JAPAN • FORMAC S.A. RIO DE JANEIRO, BRAZIL • WEISE AND CA. LDA., LISBON, PORTUGAL • CIA. DIAMANTINA B-H S.A. LIMA, PERU • R.I.E.G.A. BUENOS AIRES, ARGENTINA • HAEHRE AND CO. A/S. OSLO, NORWAY • INTERNATIONAL MACHINERY CO., SANTIAGO, CHILE • DIMITRY SCALISTIRI, ATHENS, GREECE • THOMAS M. NEVIN Y. CIA. S.A. MEXICO, D.F. • BOYLES BROS. (PTY) LTD., KITWE, NORTHERN RHODESIA • TRILLIANCE ENGINEERING CO., NEW DELHI, INDIA.

Ten Reasons Why the JR-38B

UNIVERSAL JACKDRILL

makes rock drilling a FASTER, EASIER one-man job

These Jackdrill features make the JR-38B the fastest-drilling, easiest-handling universal drilling unit ever developed



1 **Roll-Type Feed-Leg Valve,** built into handle, gives smoothly variable control from zero to full air pressure — can be reversed for right or left hand operation.

2 **Five Position Throttle** controls all functions — hole cleaning, shut-off, leg-feeding, hole collaring and drilling.

3 **Built-in Air Connection** between drill and feed leg eliminates third hose, simplifies setup and operation.

4 **Adjustable Tension** on hinge joint for easier handling.

5 **Adjustable Balance** shifts drill forward or backward to suit operator.

6 **Enclosed Steel Centralizer** has all working parts protected against dust and dirt.

7 **Constant Chuck Blowing** lubricates front end — keeps drill free of cuttings.

8 **One-Piece Chuck** with renewable recessed bushing — deflects air to side, protects operator against water splash.

9 **Rigid Construction** with fronthead recessed into deep counterbore. Built to stay on the job!

10 **Lighter Weight.** Telescopic feed leg weighs 10 lbs less than previous design. Much easier to handle.

CARSET JACKBIT IR

Longer-Lasting Carset Jackbits and the Faster-Drilling JR-38B JACKDRILL make an unbeatable drilling combination

THIS completely-integrated Jackleg Drill is designed to take full advantage of faster-drilling 1¾" Carset Jackbits — saves air consumption, saves powder, cuts bit and steel costs too. Use it as a drifter, a stoper or a Jackhamer. Ask your I-R representative for complete information or send for Bulletin No. 4144-A.

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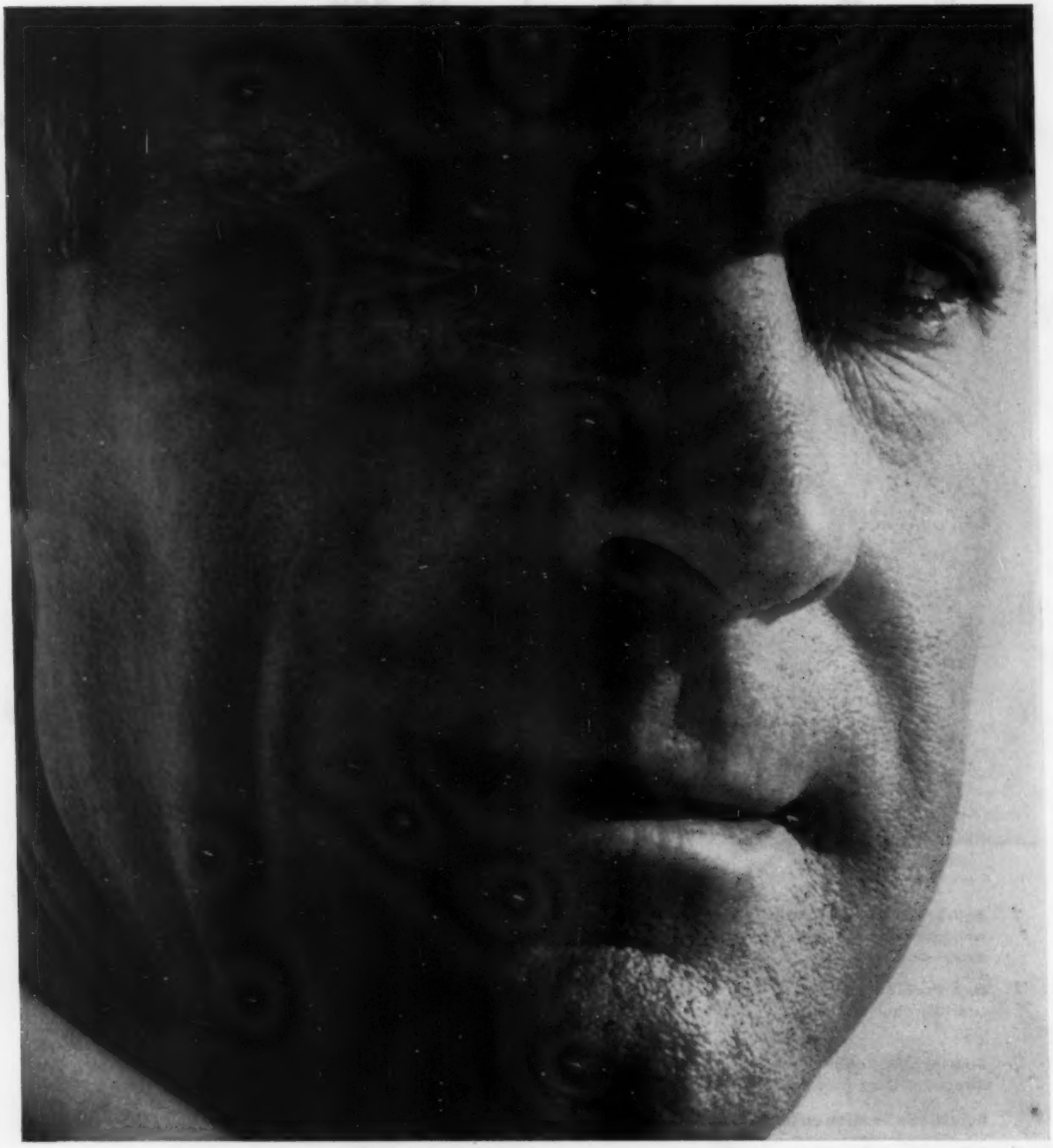

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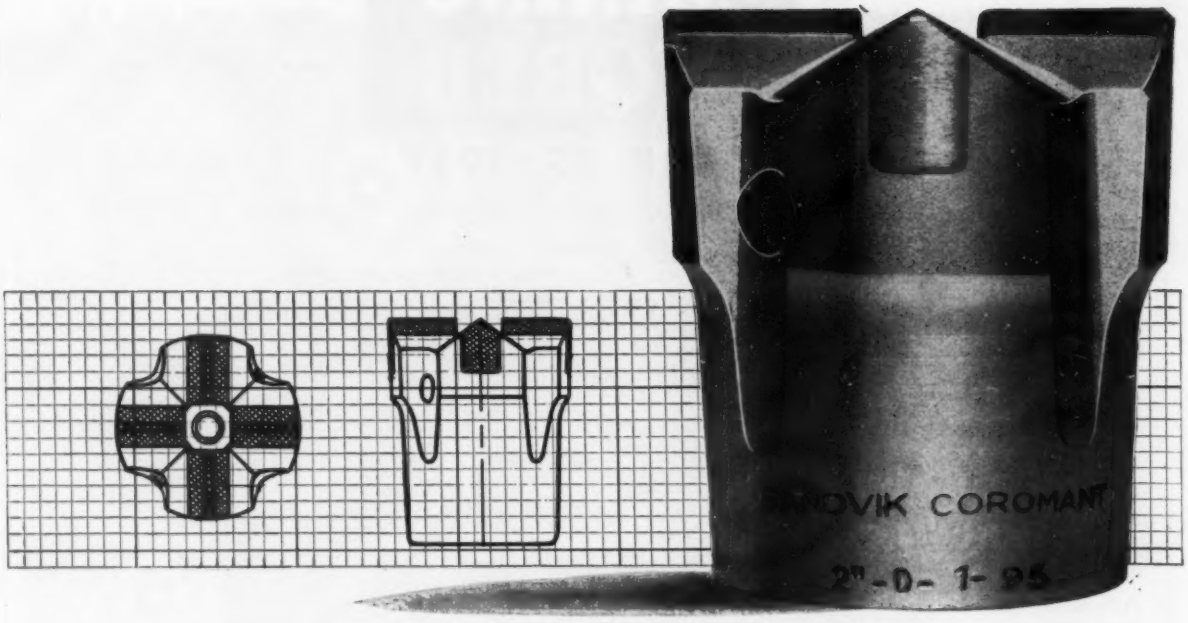
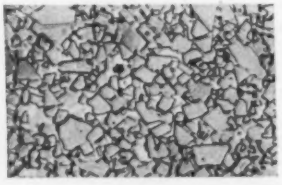
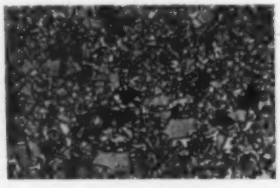


Unretouched Microphotos Prove this Rock Bit is Precision-Made for Highest Performance

THIS IS a 1200-times enlarged microphoto of the Sandvik Coromant tungsten carbide used in every Atlas Copco bit. Notice the uniformity of size and the even distribution of grain. These inserts are free of dangerous porosity and impurities—*the reason why there is no bit tougher and more wear-resistant!*



BUT THIS is ordinary carbide—full of impurities. Black marks are contaminations allowed by inefficient production and quality controls—contaminations that weaken the carbide, reduce the bit's useful working life.



The consistent quality of Coromant Carbide is no accident.

Rock bits that give *superior performance* must have the highest grade tungsten carbide inserts obtainable any where. At Sandvik, every phase of production is controlled . . . from the very first stages of ore processing, right through to the final inserts. And rigidly checked to eliminate all impurities!

Results are the Conclusive Proof of Quality

More than one billion feet were drilled with Sandvik Coromant bits and integral steel in 1955. These are other important reasons why:

- **bit bodies are made of world-renowned Swedish alloy steel—the strongest possible tungsten carbide.**
- **inserts and clearance are cylindrically-ground, and the insert ends precision-tooled to the exact same height—smoother drillings, smoother holes, because the load is equally distributed on all four inserts.**
- **threads are precision-milled in a special machine, not made with a tap—smoother bit profile and fewer fatigue failures.**

Atlas Copco Companies

offer Sandvik Coromant bits and integral steels in all standard sizes. Special illustrated literature is available on request—write for it today!

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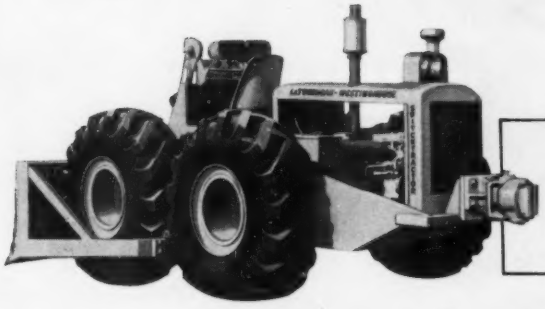
NEW
double-duty
SwitchTractor

Famous high-speed work-and-run tractor now available with standard railroad couplers. Railroad drawbar attachment now makes this famous high-speed tractor even more versatile, gives you the plus value of a go-anywhere off-track switcher for car-spotting work.



SwitchTractor

dozes, hauls, switches freight cars

Ten years hard use has improved and perfected the work-and-run Tournatractor. Thousands have proved their value in hauling, dozing, pushing, grading, scarifying, and compacting in practically every country in the world.

Doubles value of Tournatractor

Now — with the new *SwitchTractor* application—this versatile unit gives you added utility. Equipped with standard railway coupler at the rear, SwitchTractor does double-duty, switches freight cars on your siding, in yard or pit. With wide 8'4½" tire gauge, rubber-tired switcher straddles tracks of all gauges.

SwitchTractor often eliminates the need for private switch engines and engineers, saves charges and delays of railroad switch service. Your single SwitchTractor and operator may well handle all your scattered tractor-dozer work — plus whatever freight switching is required.

Off-track travel cuts switching time

Rolling on big, low-pressure rubber tires, 208 hp machine always takes the shortest route to the job. SwitchTractor can either push rail cars (with its dozer or push-plate), or pull with its coupler-equipped drawbar at rear. Tractor can start 18 empty or 5 loaded freight cars, move them up a 1% grade easily.

60% vs 30% coefficient of friction

Rolling on big rubber tires over ballast and ties, not on steel wheels over steel rails, SwitchTractor develops much more coefficient of friction (60% compares to 30%) than track locomotive of *twice* its weight. That means you have plenty of tractive power.

Worthwhile savings with SwitchTractor

If you have to move freight cars in your operations, investigate this versatile new SwitchTractor. Get all the facts on how this coupler-equipped go-anywhere tractor can save money for you in equipment and manpower economies.

SwitchTractor—Trademark, Tournatractor—Trademark Reg. U.S. Pat. Off. ST-1075-M-b

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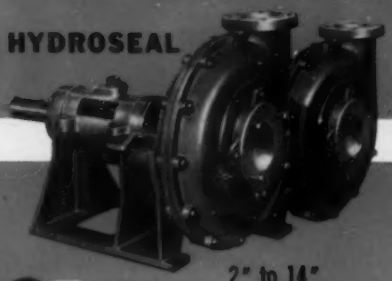
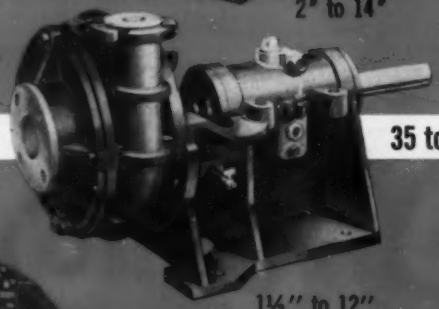


2" to 14"

HYDROSEAL

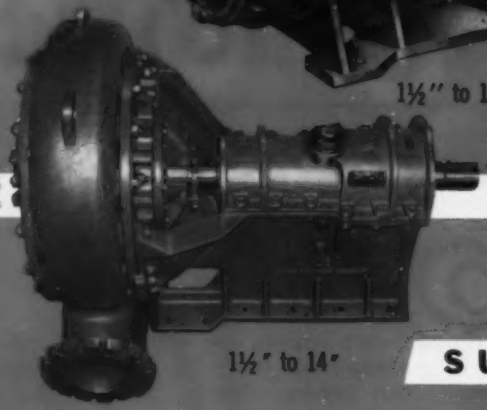
SAND — 35 to 4 mesh



1½" to 12"

HYDROSEAL

DREDGE — 3 mesh & over



1½" to 14"

SUMP — **HYDROSEAL** Slurry, Sand, Dredge 1½" to 6"

Whatever the conditions, you can select an A-S-H pump that will do the job better and longer at less operating cost. Proper application and maximum benefit will be assured, for our initial-and-continued engineering is importantly aided by kept-up performance records of our pumps in mining and processing operations throughout the Free World. Take this first step today .....

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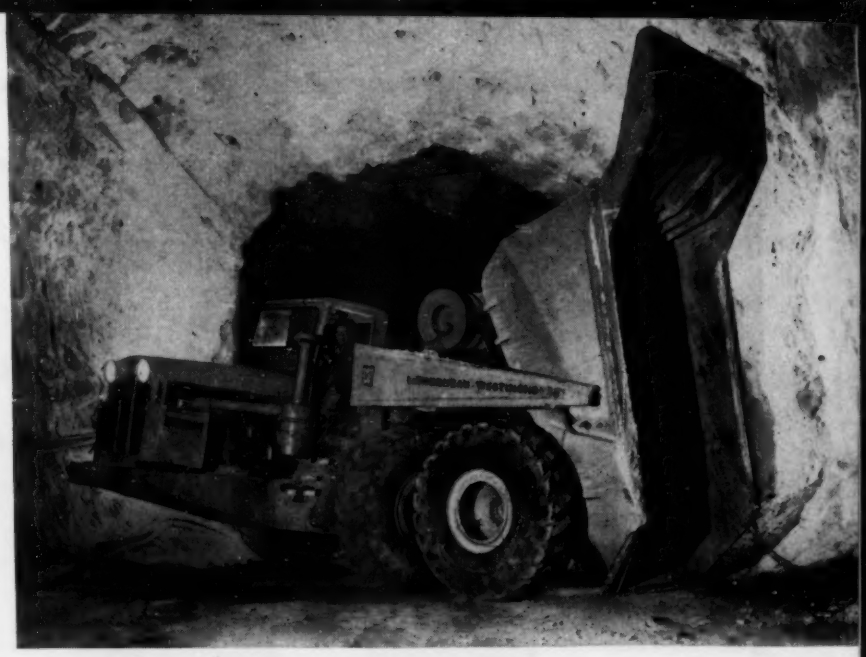
Representatives throughout the World

HYDROSEAL *and CENTRISEAL*

SAND, SLURRY & DREDGE PUMPS

MAXIMIX RUBBER PROTECTED

In cramped quarters like this, Tournapull Rear-Dump turns in dump position, which moves rear wheels forward for extremely short wheel-base. With bowl raised, 22-ton capacity C Tournapull, shown, turns 180° in only 20' 8" wide area, without backing.



Short 180° turns

boost pit output, cut handling costs

If you are interested in cutting cycle time on your pit hauls, consider Tournapull Rear-Dumps.

These high-production units are extremely maneuverable, can back into a shovel or restricted dump area faster than any haulers on the market. They make 180° turns by power steer thru geared king-pin in less than their own length. They eliminate time normally wasted maneuvering back and forth to turn in narrow quarters. They also frequently eliminate expense involved in construction of skid-plates or special turn-around areas.

Even where space is unlimited, rig's 90° prime-mover-turn gives you faster cycles. At the shovel, fast-maneuvering Tournapull Rear-Dump swings in and positions in 1 quick move. Loading unit need not sit idle while hauler operator wastes time on a wide sweeping turn, and a long, slow back-in. Quick, safe spotting saves additional production time at grizzly or dump.

Simplicity reduces maintenance

A great deal of your usual maintenance expense is also eliminated because of the simplicity of Tournapull's turn mechanism. Steering involves only an electric motor, connected to a rugged ring gear king-pin shaft. A flick of operator's finger activates motor . . . causes prime-mover to pivot up to 90° around trailing unit. Turns are made quickly, regardless of footing. There are no front steering knuckles, no reach rods, no complicated mechanisms to get out of line, maintain, or repair.

Check these, and all the other advantages of Tournapull Rear-Dumps. See for yourself how they speed haul cycles and cut costs. Write or call, any time, for owner-verified production studies and specifications. There's no obligation.

Model	Capacity	HP	Overall Length	Width req'd. for 180° turn Travel position	Dump position
D	11 tons	138	24'10"	24'8"	18'8"
C	22 tons	208	29'9"	28'8"	20'8"
B	35 tons	293	35'10"	35'	27'

These features, too, cut your hauling costs

Hauls anywhere—Travels safely over narrow haul roads, paved highways, city streets. . . hauls cross-country over terrain, thru muck, rock, and soft fill.

Dumps fast, clean — Electric motor lifts body quickly to any desired dump angle . . . bowl tips behind rear wheels for clean over-bank spill. Streamlined body sheds material readily.

Cuts weather delays — Power-transfer differential applies extra power to wheel on firmest footing . . . pulls rig through mud, sand, soft materials.

Rugged body loads easily—Big bowl opening is easy loading target. Three layer, *all-steel* bowl with tool-steel floor resists wear and shock. Available with optional tailgate.

Improves safety — More than 4 times the braking surface of ordinary haulers plus optional electrotarder, low center of gravity, excellent visibility, front-wheel drive, easy control, all contribute to maximum safety.

Reduces fatigue — Big tires and air-foam cushioned seat smooth out ride for operator. Electric power steer and 2-way power dump make work easy.

Insures future earnings — Behind basic prime-mover you can interchange other trail units: scraper, bottom-dump, lift-and-carry crane, logging-arch, flat-bed hauler. Keeps your Tournapull busy at a profit all year-around.

Tournapull—Trademark Reg. U.S. Pat. Off. R-1168-M-b

LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

DIAMETER OF CAN OR CARTRIDGE	LOADING DENSITY: POUNDS PER FOOT OF BOREHOLE		
	SPECIAL GELATIN 75%	"NITRAMEX" NO. 2	"NITRAMEX" 2H
4½	9.6	11.0	12.5
5	11.8	14.5	15.8
5½	14.2	17.5	19.3
6	17.0	20.8	22.5
6½	19.9	24.5	26.5
7	23.1	28.0	30.8
7½	26.5	32.5	35.3
8	30.2	37.0	40.0
8½	34.0	41.3	45.0
9	38.2	45.3	49.0

Now A New Hard-Hitting Blasting Agent, for tough shooting... better breakage

Du Pont Heavy "Nitramex®" No. 2H*

For open pit shooting where tough bottoms and formations have proved hard to overcome, Du Pont now offers a higher density "Nitramex" No. 2, called "Nitramex" No. 2H.

In field tests this new product has produced noticeably better breakage in such tough shooting material as taconite, magnetite, massive sandstone and hard, dense dolomite. Because it also has infinite water resistance, it may be loaded in wet holes as long as necessary before shooting.

The new heavy "Nitramex" No. 2H has a density of 1.80 compared to 1.60 to 1.65 for regular Du Pont "Nitramex" No. 2. The smallest size currently available (4½" x 24") weighs 25 pounds compared to 22 pounds for the regular "Nitramex" No. 2. "Nitramex" No. 2H can be consistently detonated with maximum safety by either a "Nitramon" or a "Nitramite" primer.

For technical information on this newest, strongest member of the Du Pont family of blasting agents, contact your Du Pont Explosives representative or write E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Del.

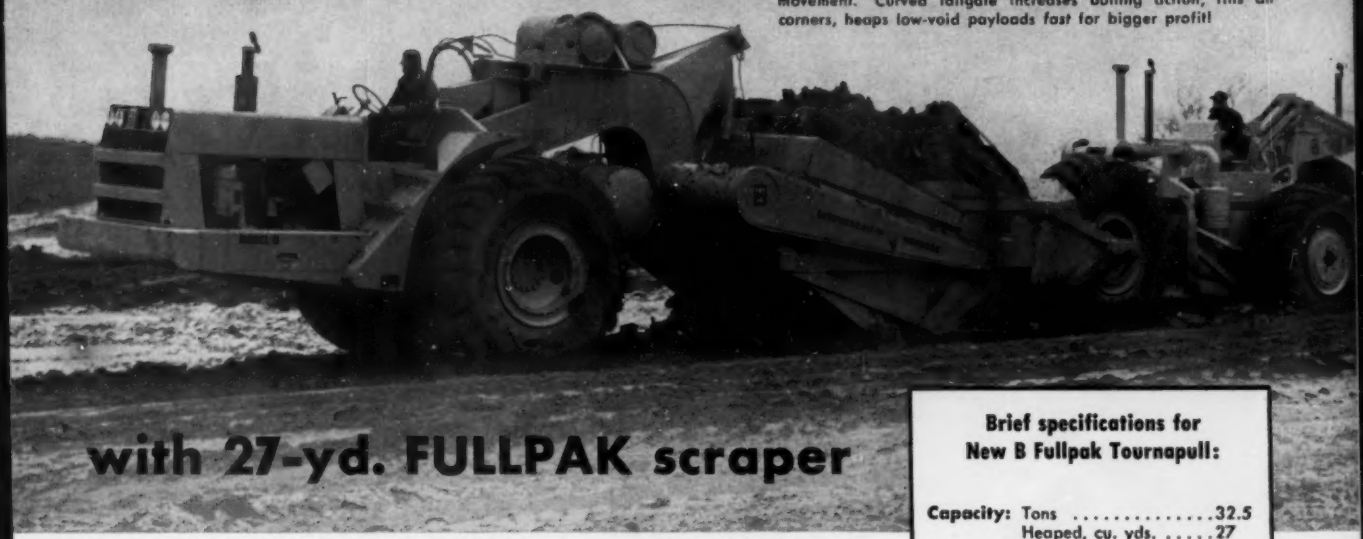
*PATENT APPLIED FOR

DU PONT
BLASTING AGENTS
Products of Du Pont Research

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING ... *THROUGH CHEMISTRY*

NEW B Tournapull



Lively bowl heaps capacity-load *fast*. Low push-block gives direct-line application of power from pusher to blade. Smooth, wide side-arms and side-sheets can't trap chunky materials. Inside bowl has no exposed reinforcement ribs to hinder dirt movement. Curved tailgate increases boiling action, fills all corners, heaps low-void payloads *fast* for bigger profit!

with 27-yd. FULLPAK scraper

New, low, wide B Fullpak scraper gets *big* loads *fast!* Designed for lowest-cost dirtmoving, it incorporates the same exclusive high production features of the 18-yd. C Fullpak Tournapull, proved in world-wide service for more than a year. This new companion 27-yard B Fullpak loads just as fast. Here's why:

Low, wide bowl — New B Fullpak bowl bottom has only 1° rise. In loading, dirt flow is nearly horizontal — packs full-capacity, low-void payloads quick and easy.

Better boiling — Tailgate has curved top to roll material into the heap, fill all corners. High-heap side-sheets reduce spillage, help pack material into corners.

High apron lift — Raises 7'1" above blade, speeds loading and unloading. Smooth, streamlined side-arms and side-sheets prevent chunky materials from being trapped. Deeply curved apron adds payload capacity . . . carries more of the load forward for better weight distribution and low center of gravity.

10 speeds — Heavy-duty transmission provides ten gear ratios, from 2.6 to 28.4 mph. Low gear matches pusher speed, enables 293 hp B Fullpak to help itself in loading, gives full lugging power for pulling through soft, spongy footing. This combination of 10 speeds, plus clutch-brake for fast shifting, means hauling at higher speeds . . . more pay-yards per hour.

Effortless control — Push-button electric control, and electric power-steer through geared kingpin, make handling easy. All-weather electric motors at points of action give instant steering and scraper control.

These are but a few of the many plus-values awaiting you in this new 27-yd. B Tournapull. Get the complete story . . . see how this BIG "B" with new *fast-loading* Fullpak scraper can earn big dividends for you! Write for full details.

High-lift apron, and positive forward-ejection tailgate, speed loading and unloading. Deeply curved apron adds dirt capacity, carries a big part of the load forward for better weight distribution, low center of gravity, and greater stability. Wheels inside cutting edge aid in precision grading, permit cutting against bank.

Brief specifications for New B Fullpak Tournapull:

Capacity: Tons 32.5
Heaped, cu. yds. 27
Struck, cu. yds. 19.1

Power: 293 hp Cummins Diesel

Tires (std.): Four 27 x 33 — 30-ply rating

Speeds: Ten forward 2.6 to 28.4 mph
Two reverse 2.4 to 3.5 mph

Turning angle: 90° left or right

Width required for 180° turn: 39'10"

Control: Fingertip Electric

Brakes: Multiple-disc air brakes with 6552 sq. in. of braking surface

Dimensions:
Length . . . . . 44'0"
Width . . . . . 11'8½"
Height . . . . . 12'2¼"
Wheelbase . . . . 26'10"

Shipping Weight (approx. lbs.) 68,900

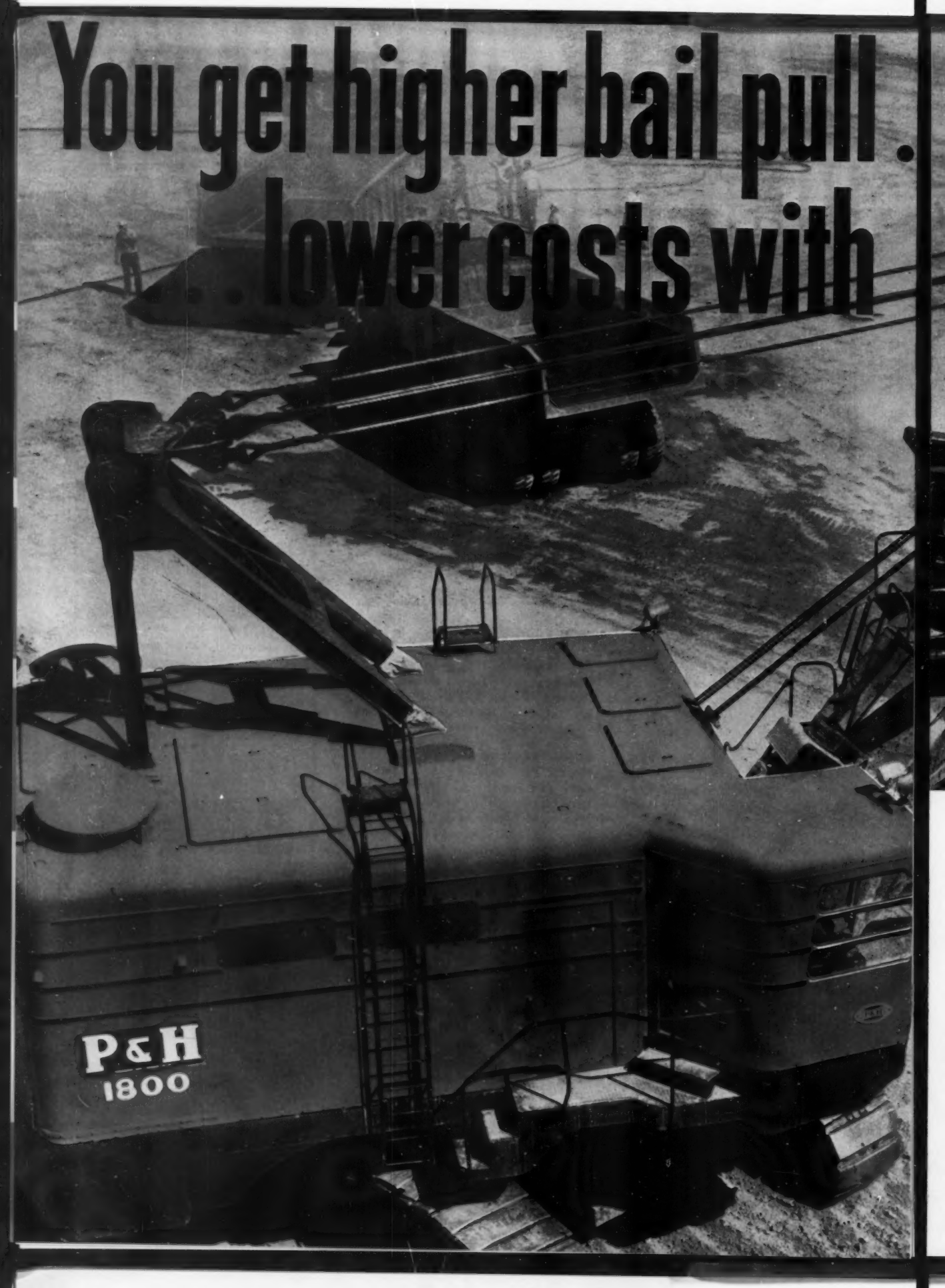
(Specifications subject to change without notice)

Fullpak—Trademark; Tournapull—Trademark Reg. U.S. Pat. Off. BP-1402-G-b

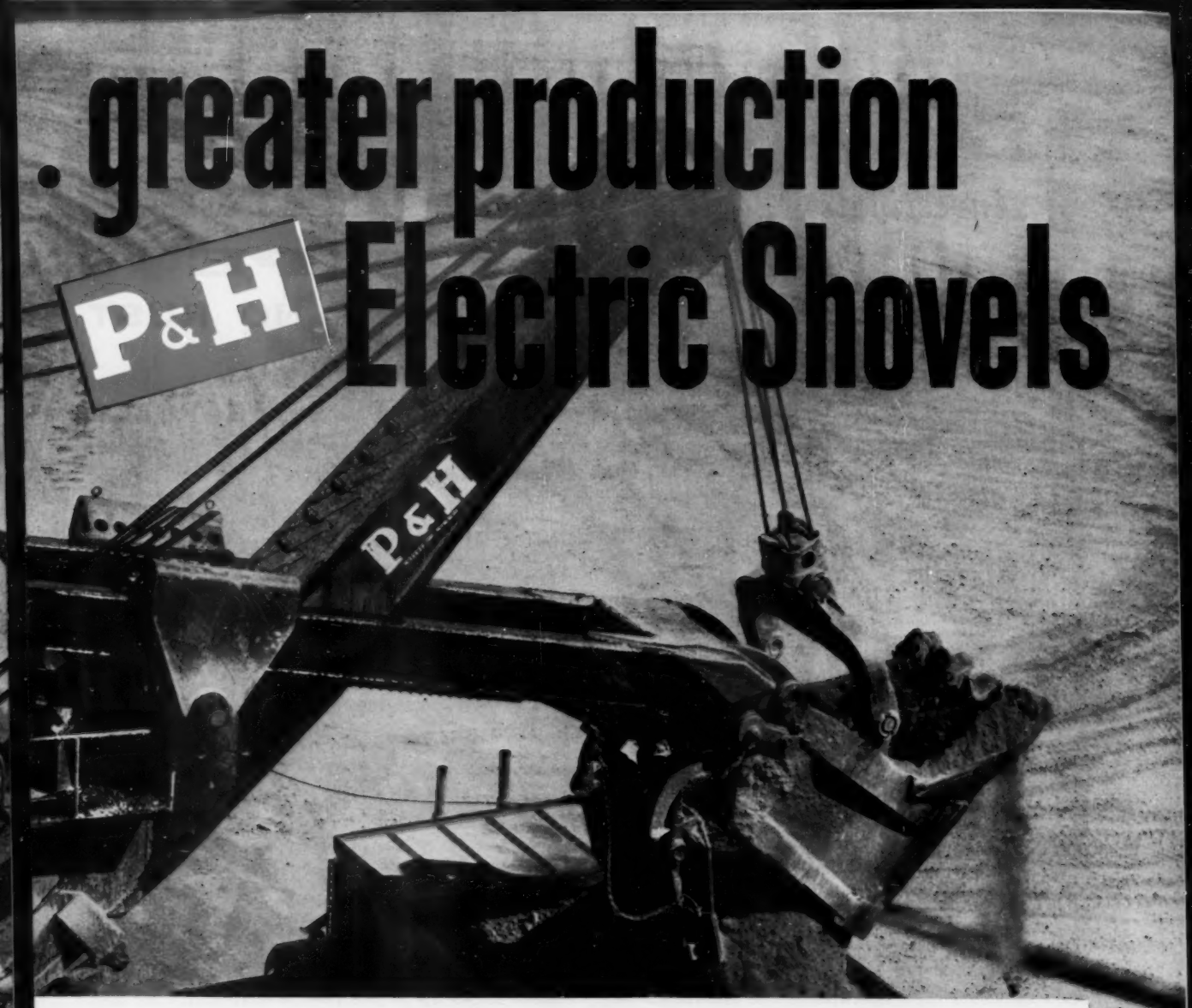
LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit


You get higher bail pull .
. . lower costs with
P&H
1800

. greater production P&H Electric Shovels



P&H scientific weight distribution gives greater stability permitting the use of higher line pull per cu. yd. of dipper capacity—resulting in greater production at lower cost.

For P&H has set the design standards for the electric shovel industry with these *exclusive features:* Magnetorque* and P&H Electronic Controls.

MAGNETORQUE . . . transmits power from the hoist motor to the dipper magnetically for faster action, and at the same time, eliminates shock and impact to the hoist gear train and motor. Response is immediate to varying load conditions.

ELECTRONIC CONTROLS . . . P&H designed and built to provide fastest action of any type of control available on electric shovels. All motions are smoother, resulting in consistently higher output.

Magnetorque and P&H Electronic Controls mean reduced maintenance and greater availability.

With P&H you get single source responsibility. Another distinct advantage experienced only by users of P&H Electric Shovels. P&H designs, manufactures and applies all electric rotating equipment specifically for electric shovel service.

*T. M. of Harnischfeger Corp. for electro-magnetic type coupling.

P&H ELECTRIC SHOVEL LINE:
3½ through 8 cu. yd. capacities.

HARNISCHFEGER

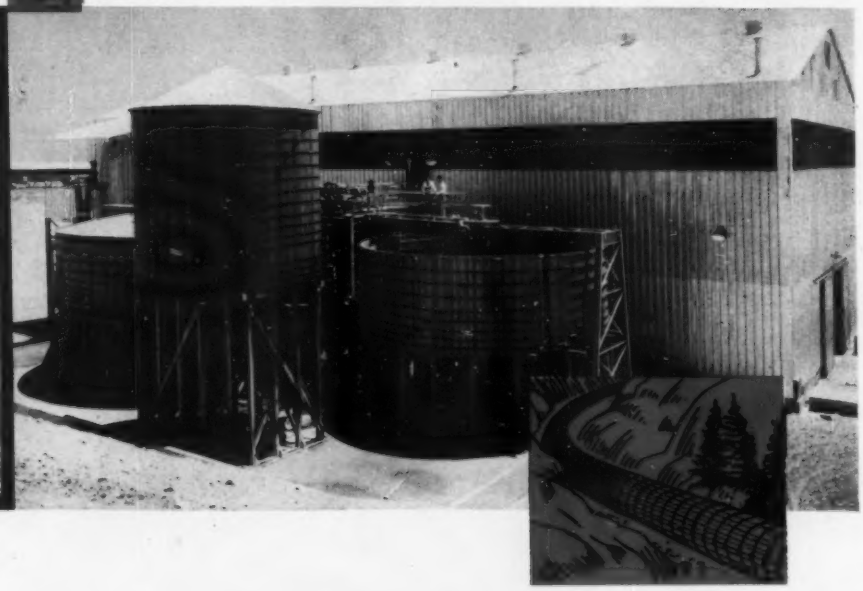
CONSTRUCTION & MINING DIVISION
Milwaukee 46, Wisconsin

investigate the savings

WOOD TANKS and PIPE

NO CORROSION, NO RUST

MINING TANKS FOR ALL PURPOSES



Uranium processing mills use many large wood stave tanks for their operations. The picture above is of a portion of an Arizona uranium plant which used over twenty wood stave tanks. Thickener tanks were 40′ x 10′, water storage tank 20′ x 18′, all on elevated supports.

Other uranium mills are using "Santa Fe" wood stave tanks up to 100 feet in diameter. One new mill has five wood tanks 100′ x 12′, with others of smaller sizes. Polyethylene tubing is generally utilized for hoop protection on all acid solution tanks.

- Thickener Tanks
- Solution Tanks
- Agitation Tanks
- Water Storage Tanks
- Conical Bottom Tanks
- Wood Flotation Cells
- Wood Precipitation Boxes
- Rectangular Tanks
- Wood Stave Pipe
- Wood Stave Flumes
- Wood Fume Stacks
- Wood Scrubber Towers

Santa Fe Tank Division

FLUOR PRODUCTS COMPANY

A Division of the Fluor Corporation, Ltd.

GENERAL OFFICES: 12000 East Washington Boulevard • Whittier, California

Telephone WHITTIER — OXford 3-3781, or LOS ANGELES — RAymond 3-8247

3½ through 8 cu. yd. capacities.

Milwaukee 46, Wisconsin

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Demag-Elektrometallurgie, G. m. b. H.

Duisburg, Germany

is pleased to announce that they now have
the exclusive license in the
United States and Canada for the
manufacture of

DEMAG ELECTRIC SMELTING FURNACES

for all smelting,
refining and reduction operations

●

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engineering service or product information to

LECTROMELT FURNACE DIVISION
Mc Graw-Edison Company
324 32nd Street • Pittsburgh 30, Pennsylvania

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BLADE POWER

HUBER
WARCO

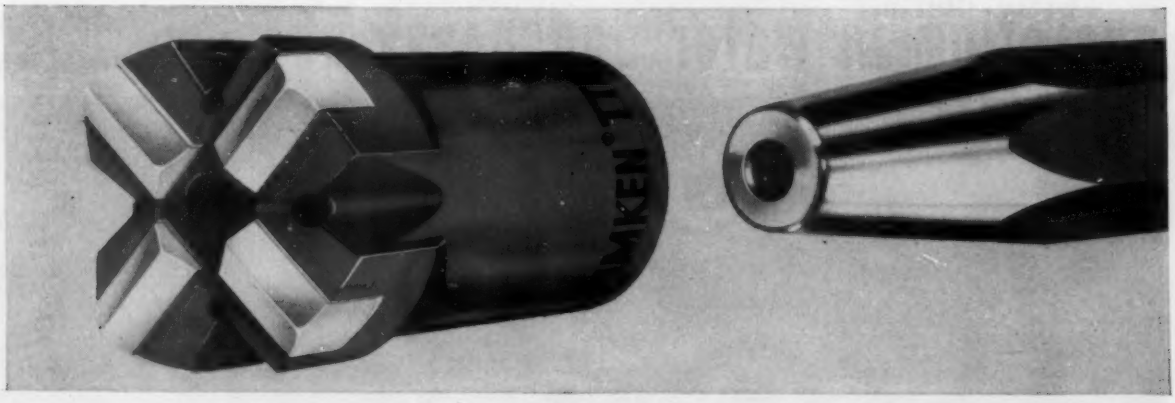
6-D & 7-D SERIES MOTOR GRADERS

The tail-shaft governor on the Huber-Warco 6-D & 7-D motor graders automatically adjusts the engine RPM to meet load conditions. This assures constant power at the blade for a greater work volume. Torque-converter and power-shift transmission are standard. See your nearest Huber-Warco distributor for details.

HUBER-WARCO COMPANY • Marion, Ohio

New Timken® bit for air-leg drills and light stoping...

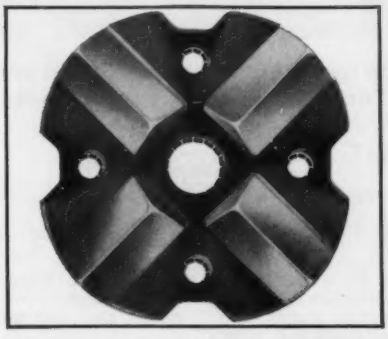
REMOVABLE for full steel life
TAPERED for more secure union



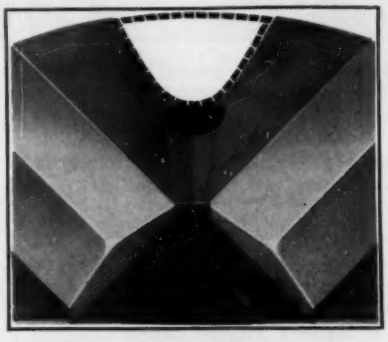
Here's how you can get lower cost per foot-of-hole with the new Timken® tapered socket bit. It's removable! Simply take off the old bit, put the new one on the same drill steel. No need to throw away the steel when the bit is used up. You can drill out the full life of every steel, cut your reconditioning costs to a minimum. And with its uniformly tapered socket the new Timken removable bit provides a more secure union than threads for feed-leg drills. Precision-made, the taper fits tight to the drill steel, reduces breakage, helps this new Timken bit lower your cost per foot-of-hole.

The bit body is made of special analysis Timken electric furnace fine alloy steel—giving you the finest in physical properties obtainable in a rock bit today. Special analysis carbides give the Timken tapered socket bit superior wear-resistance with added shock-resistance. It holds its gauge longer, drills faster, can be reconditioned many times. And it's available in three popular sizes: 1¼", 1⅜", and 1½". Send for free brochure today. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

TWO NEW FEATURES CLEAR CHIPS FASTER



NEW 5 FRONT HOLES direct water against face with jet-action velocity to wash away chips faster. Larger center hole has plug dropped deeper for freer cutting action, less drag on bit.



WIDER, DEEPER CLEARANCE works in unison with five front holes to remove chips speedily from cutting face. This faster chip flow speeds drilling, makes cutting more efficient, adds life to bit.

TIMKEN MULTI-USE BIT (left) with correct, controlled reconditioning gives lowest cost per foot-of-hole when full increments of steel are used. **NEW TIMKEN THREADED CARBIDE BIT** (right) for other tough jobs. Improved thread contact reduces breakage. New wear-resistant carbides add life.

TIMKEN REMOVABLE ROCK BITS

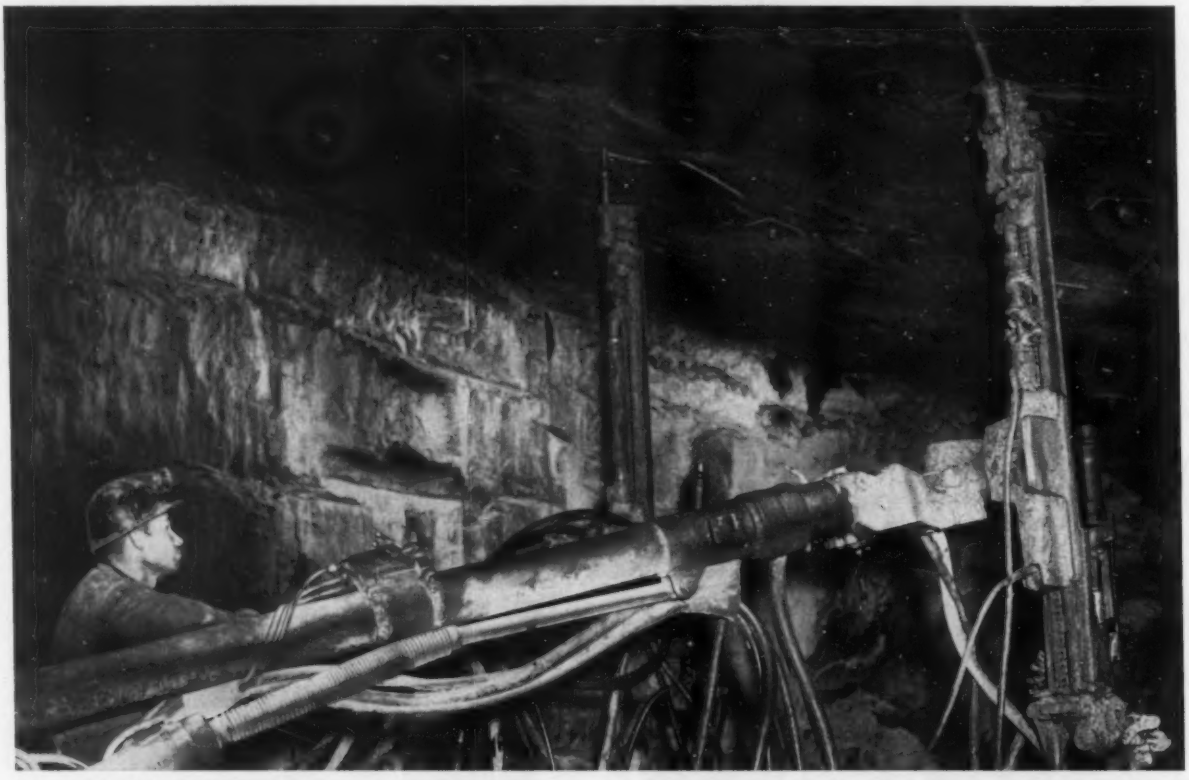
TRADE-MARK REG. U. S. PAT. OFF.

ENGINEER'S FIELD REPORT

LUBRICANT CHEVRON* VISTAC OIL

LOCATION A COAL MINE IN UTAH

Chevron* Vistac Oil protects mine roof bolters operating in water and heavy abrasive dust

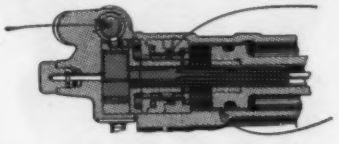


WORKING CONSTANTLY in heavy abrasive dust, high humidity and water in one of Utah's largest coal mines, these Joy roof bolters are lubricated with Chevron* Vistac Oil. To eliminate crossbar timbering and provide greater safety and increased production, these air tools drill holes, hammer bolts and tighten nuts on steel bearing plates. Bolts up to 8 feet long are rammed in to refusal at pressures up to 3,000 lbs. psi.

The master mechanic for underground operations at the mine reports: "Vistac Oil has proved completely satisfactory for this tough service. It continues to lubricate and protect these machines even under our most difficult dust and water conditions." Chevron Vistac Oil is also used in all other air equipment in the mine.

For More Information about this or other petroleum products of any kind, or the name of your distributor, write or call any of the companies listed below.

Why Chevron* Vistac Oil cuts costs in air-tool equipment



- Atomizes quickly and completely—carries evenly over all parts. Prevents excessive fogging and has no unpleasant odor.
- Additives help form tenacious, oily, pressure-resistant film in wet or dry conditions—cuts wear and power loss. Small quantity lubricates efficiently.
- Resists high temperatures and oxidation. Stays fluid at low temperatures.

CHEVRON Industrial Lubricants

* The Chevron Brand covers the line of industrial products formerly sold under the Calol name. This is a name change only. The high quality and specifications remain the same.

TRADEMARK "CHEVRON," "VISTAC" AND DESIGN REG. U.S. PAT. OFF.

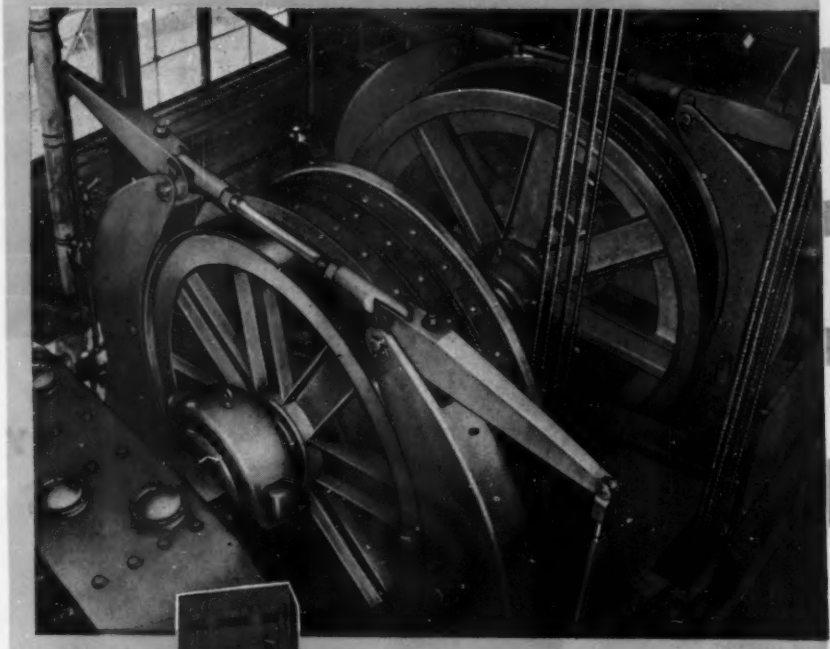
STANDARD OIL COMPANY OF CALIFORNIA, 225 Bush Street • San Francisco 20, California

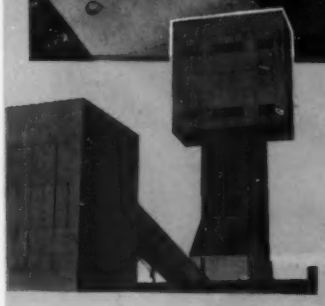
THE CALIFORNIA COMPANY, P. O. Box 780 • Denver 1, Colorado

STANDARD OIL COMPANY OF TEXAS P. O. Box 862 • El Paso, Texas

FIRST MULTI-ROPE FRICTION HOISTS

IN U. S. BRING MAJOR SAVINGS IN INSTALLATION AND OPERATING COSTS





The tower-mounted ASEA multi-rope friction-drive hoists pictured here were installed by Cleveland Cliffs Iron Ore Company in the Cliffs Shaft Mine, Ishpeming, Mich. The installation consists of two ore hoists and one service hoist mounted in one head frame. The skip load is 15 tons, maximum speed 2000 ft/min; maximum depth 4000 feet; pushbutton controls.

Pioneering in the design and development of multi-rope friction-drive hoists, ASEA offers the advantage of its engineering background and wide experience in this new concept in mine hoisting. 14 ASEA mine hoists are on order for the U. S. and Canada—7 now operating.

Outstanding advantages of ASEA friction drive mine hoists

SAFETY

1. Several parallel ropes are used instead of a single rope.
2. Safety wedges on shaft guides assure rope slip and prevent overwind.

ROPE WEAR

1. Less wear due to elimination of fleet angle, absence of S-bends, and elimination of cross-overs in multilayer practice.

GUIDE WEAR

1. Less wear because ropes are arranged L.H. and R.H. lay so as to counteract any tendency of the conveyance to twist.

SIZE AND COST OF HOISTING UNIT

1. Smaller diameter and narrow width of pulley give low unit weights and reduced inertia.
2. Compact size and low weight permits installation in headframe above shaft with gravity flow through ore preparation plant.
3. Above factors result in lower initial capital and operating cost.

POWER DEMANDS AND CONSUMPTION

1. These are lower—due to balancing weight of tail rope and the decreased inertia of rotating parts.
2. Peak demands of individual conveyances in multilevel operation can be offset automatically by electric control.

FLEXIBILITY

1. Friction drive pulley can be used as a single drum, single rope hoist for initial shaft sinking.
2. Independent operation of single hoists with counterweights permits hoisting from different levels concurrently.

Illustrated booklets on ASEA mine hoists are available upon request.

ASEA equipment is sold and serviced in the U. S. by:

AROS ELECTRIC, INC.

500 FIFTH AVENUE, NEW YORK 36, N. Y.

to pump, crush, power, or transport most efficiently

use HALL-SCOTT engines

Famous veterans in all types of mining operations are the renowned Hall-Scott engines for trucks, pumps, crushers, compressors, and generators. Above, a Hall-Scott powered Oshkosh used in open pit mining.

There are a variety of Hall-Scott engines of 225 to 368 h.p., powered by gasoline or LPG. Hall-Scott's tremendous torque easily pulls enormous loads up steep grades on bad footing. These engines last longer and require a minimum of downtime because they are precision built.

For full details on Hall-Scott specifications for your new equipment or for repowering, write today for the name of your closest dealer.

A note to Hall-Scott engine owners: If your records indicate that your Hall-Scott engine has operated over a million miles, inquire about our Million Miler Award.

The Million Miler
Model 6182-B-1

Only Hall-Scott among truck and industrial engines offers the overhead camshaft. It is one example of Hall-Scott attention to excellence. The overhead camshaft has many advantages... most important, simple maintenance. It allows the entire head assembly to be removed easily; valves may be ground right on the bench.

Hall-Scott INCORPORATED POWER DIVISION 2850 SEVENTH STREET, BERKELEY, CALIFORNIA

PERFECTION IN PACKAGED POWER

ON THE RANGE...more ore is mined with BUCYRUS-ERIE ELECTRIC SHOVELS than with any other make

On the Mesabi Range, more ore is mined with Bucyrus-Erie electric shovels than with any other make—and with good reason. Mine operators have learned they can count on Bucyrus-Eries for highest production at reasonable cost. They set the pace for output, economy, and dependability.

Back of this superior performance are many Bucyrus-Erie design and manufacturing extras. The exclusive two-section boom with tubular dipper handle, for instance, reduces front-end weight, speeds dig-swing-dump cycles. Rugged strength, from boom point to treads, contributes to dependability and low maintenance. Smooth Ward Leonard electric control means fast, accurate response—extra torque when it's needed.

Write for more information on the excavators that set the standards on the Range.

140L57

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UNITED STATES · VENEZUELA · ALGERIA · PERU · CANADA · CONGO · ENGLAND · SWITZERLAND · FINLAND · FRANCE · AUSTRALIA · INDO-CHINA · CHILE · NORTH AFRICA · MOROCCO · PHILIPPINES · RHODESIA
10-B 4½-cu. yd.
150-B . . 6-cu. yd.
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BUCYRUS ERIE

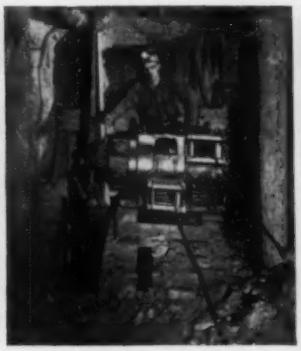
BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE, WISCONSIN

Gardner-Denver . . . Serving the World's Basic Industries

Lightweight Air Feed Leg Drills

Automatic Water-Control Stopers

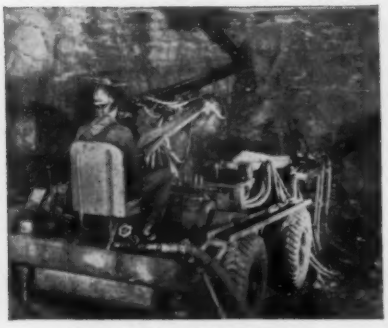


Load-Lugging Airslushers

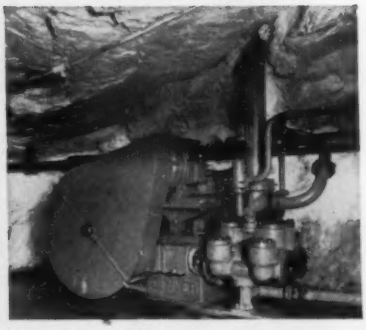
Fast-Drilling Drifters

Quality Gardner-Denver cost-cutters for development and production

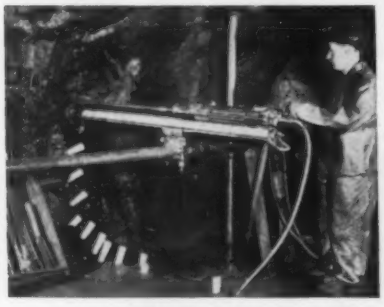
Drill Steel Shapers and Sharpeners



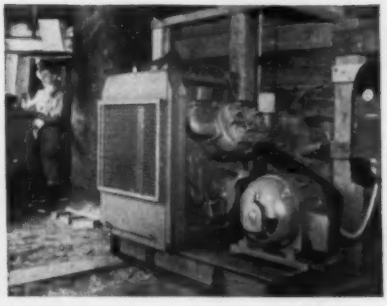
Push-Button Mobiljumbo



De-Watering, Grout and Sump Pumps



Deep Hole Drilling Equipment



Air Compressors, All Types and Sizes

Fast, Safe Mine Car Loaders

See your Gardner-Denver mining equipment specialist — or write for bulletins.

ENGINEERING FORESIGHT—PROVED ON THE JOB
IN GENERAL INDUSTRY, CONSTRUCTION, PETROLEUM AND MINING

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Gardner-Denver Export Division, 233 Broadway, New York 7, New York
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

always on the job

That's a benefit more and more mining operators experience with their Macks. They know that Macks keep going 'round the clock . . . taking the steepest grades and roughest terrain in stride . . . always hauling extra-capacity loads . . . with time out for only routine servicing and maintenance.

Mack off-highway dumpers—four basic models with rated capacities from 15 to 34 tons—are built for enduring performance. Mack or stock diesel engines ranging from 170 to 400 hp, all delivering maximum torque at low r.p.m. . . . famous Mack transmissions with two-speed compounds or torque converters . . . exclusive two- and four-wheel rear-axle drives with planetary gear reduction in the wheel hubs to provide smooth power transfer without excessively large gears in the carriers . . . Mack's unique Balanced Bogie with Power Divider, the four-wheel, rear-axle drive that delivers maximum power to the wheels with traction . . . off-set cabs designed for maximum visibility and driver efficiency . . . these and many more features make Mack the performance and economy leader of the industry.

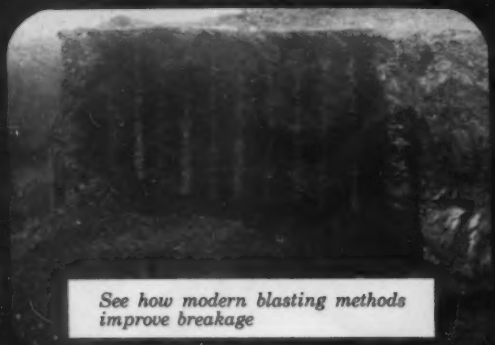
Why not join the swing to Macks—the swing that means maximum hauling efficiency at minimum unit costs for so many operators. Contact your Mack representative for full details and specifications. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

4869

MACK
first name for
TRUCKS

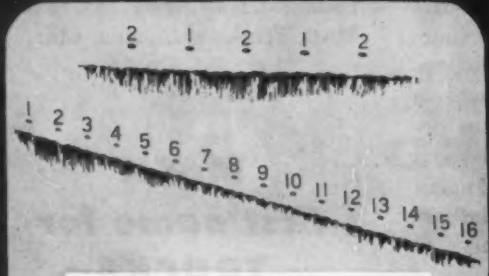
TO HELP YOU BLAST WITH GREATER ECONOMY

The INSIDE STORY



See how modern blasting methods improve breakage

See how the point of initiation affects rock movements...controls throw



See the difference between progressive and alternate detonation

Don't miss this movie for men who use explosives in Quarries, Strippings and Construction!

Here is a motion picture that gives the facts on modern blasting techniques. It shows how you can save money through better, more complete fragmentation . . . how you can increase safety by eliminating the need for secondary blasting . . . and how your public relations can be improved by holding noise and vibration to a minimum.

"*The Inside Story*" is prepared by Atlas Powder Company as a technical service. Show it to your organization for a better understanding of scientific blasting. It explains in detail how the point of initiation affects blasting results . . . how millisecond delay techniques and alternate velocity loading are used to gain maximum efficiency.

This information also makes "*The Inside Story*" well suited for showing at institute meetings and to other engineering groups.

How to get the film. Simply write us on your letterhead, telling us at what type of meeting you'd like to show "*The Inside Story*," and approximately when you'll need it. We'll try to ship a print to you well in advance of the date you select.

Ask also about other Atlas educational material such as the films, "*How to Handle Women and Explosives*" (for your safety meetings), and "*We're Blasting Near You*" (to show to your neighbors). And write for "*Better Blasting*," the informative Atlas newsletter on latest blasting materials and methods.

EXPLOSIVES DIVISION

ATLAS POWDER COMPANY

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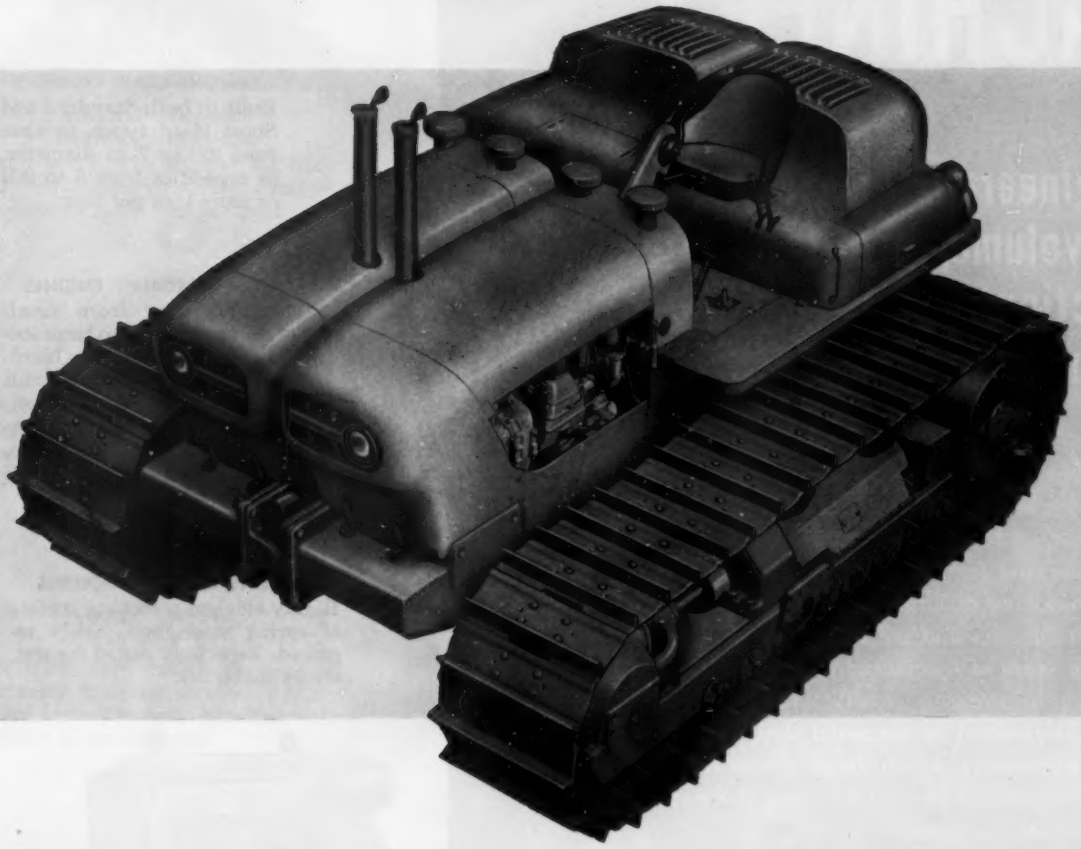
NOW THE Euclid TC-12 GIVES YOU

more horsepower... more track area... more accessibility than any other crawler!



Ever since it was introduced more than a year and a half ago, the Euclid TC-12 Tractor has set completely new standards of crawler production and performance. It has proved, on job after job, that it is years ahead of the field in ability to do more work—faster, easier and cheaper. Now the TC-12 has even more power to handle the biggest tractor jobs.

Powered by two 218 h.p. engines with separate Torqmatic Drives for each track, there's a total of 436 horsepower. Big 27" standard shoes and 8 track rollers give good balance with the additional horsepower, heavy duty dozer blades and other attachments.

This new TC-12 Crawler has many other improvements that put it even further ahead of other tractors . . . in performance, ease of operation, maneuverability and service accessibility. Ask your Euclid dealer to prove that the TC-12 has no equal for big tractor jobs and have him show you why ***Euclids are your best investment.***

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

NORDBERG MACHINERY

...engineered for large volume, quality production of ores and industrial minerals

The entire line of heavy-duty Nordberg Mining Machinery has been engineered and built for one basic purpose . . . to meet the mining industry's expanding demand for low cost, quality production and processing of large tonnages of metallic and non-metallic ores and industrial minerals.

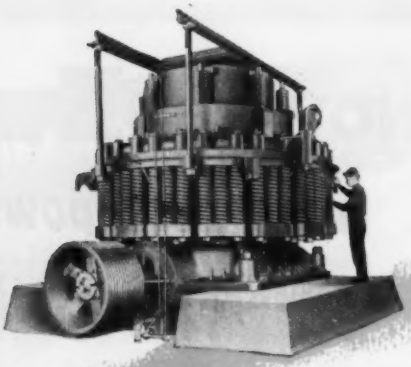
The many years of specialized experience gained by Nordberg in working closely with the mining fraternity has resulted in continual design and operational improvements which have consistently made Nordberg Machinery first choice among the world's leading ore and mineral producers.

As illustrated, Nordberg Mining Machinery includes Symons® Gyratory Crushers for primary breaking, Symons Cone Crushers for secondary and tertiary crushing, Nordberg Mills for wet or dry grinding, Symons Vibrating Grizzlies and Screens for scalping and sizing, and Nordberg Engines for mine and mill power.

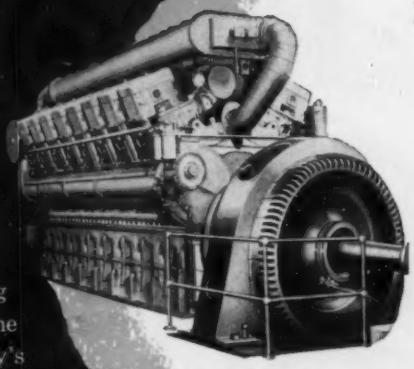
Write for literature on the Nordberg Machinery you need to efficiently produce large tonnages of ores and industrial minerals at lower cost per ton.

SYMONS . . . A Registered Nordberg Trademark known throughout the world

NORDBERG MFG. CO.
Milwaukee, Wisconsin



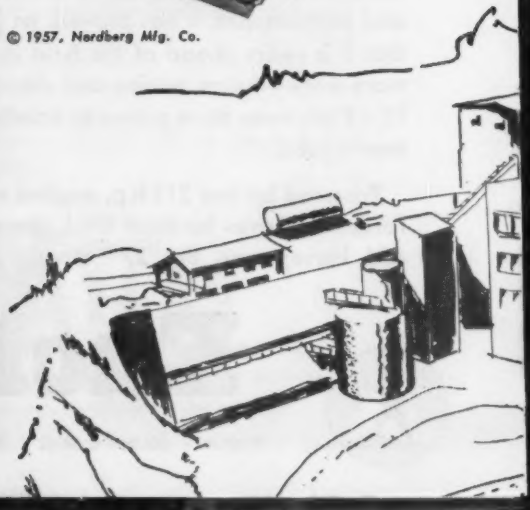
SYMONS CONE CRUSHERS
Built in both Standard and Short Head types, in sizes from 22″ to 7′ in diameter, in capacities from 6 to 900 or more tons per hour.



NORDBERG ENGINES
Ranging from small power units to large stationary engines. Nordberg engines are built in types for Diesel, Duafuel® and Spark-Ignition Gas operation, in sizes to over 12,000 horsepower.

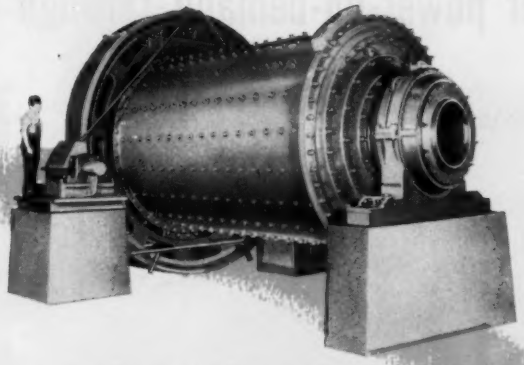
SYMONS ROD DECK SCREENS
Highly efficient screening surface of spring steel rods—easily replaced. Especially suited for wet, sticky materials.

© 1957, Nordberg Mfg. Co.



SYMONS® PRIMARY GYRATORY CRUSHERS

Built in 30″, 42″, 48″, 54″, 60″ and 72″ feed opening sizes, for capacities to 3500 or more tons per hour.

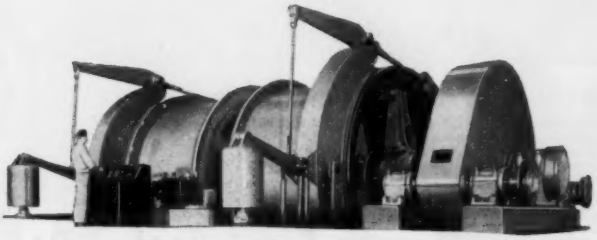


NORDBERG GRINDING MILLS

Built for wet or dry, open or closed circuit operation . . . including Rod, Ball, Pebble, Tube and Compartment types, in sizes from 6′ to 13′ dia., up to 50′ in length.

NORDBERG MINE HOISTS

Built in both friction and drum types for hoisting both ore and men. These dependable hoists are widely used in large coal and metal mining operations.

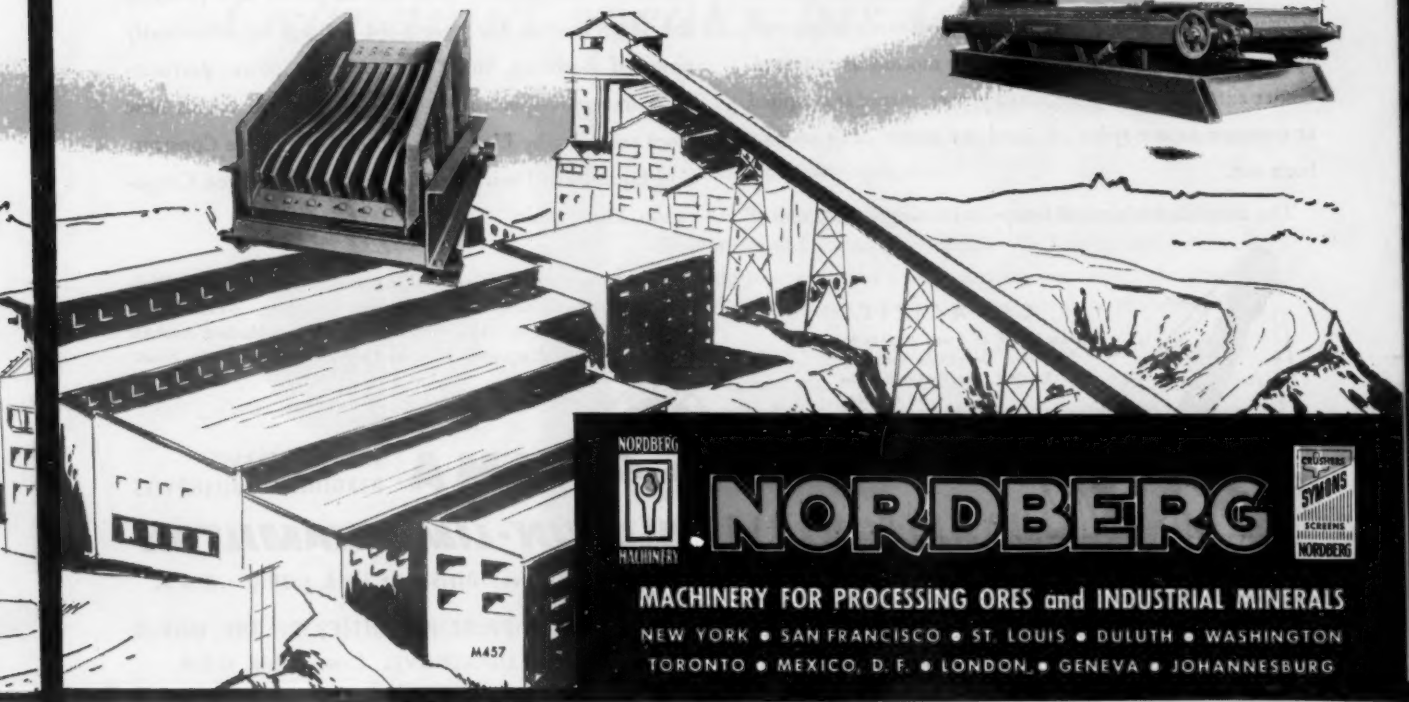


SYMONS VIBRATING BAR GRIZZLIES

Built for heavy duty large capacity primary scalping service. Particularly effective when handling wet, sticky or gummy ores.

SYMONS HORIZONTAL VIBRATING SCREENS

Permit level, large capacity screening of extreme accuracy. Built in single, double and triple deck types in a wide range of widths and lengths.



NORDBERG MACHINERY

NORDBERG

CRUSHERS SYMONS SCREENS NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • ST. LOUIS • DULUTH • WASHINGTON
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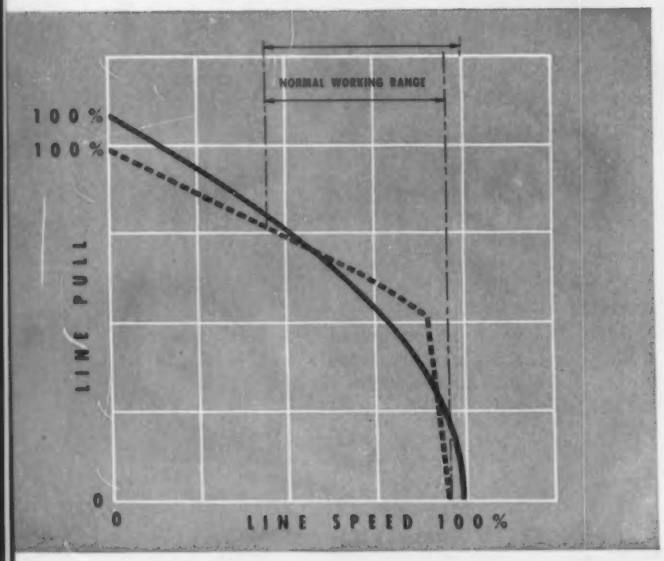
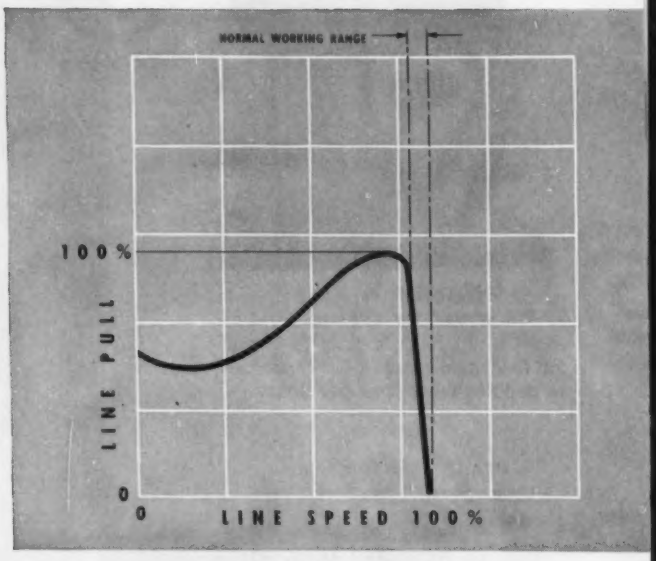
LIMA teams A.C. electric motor with torque converter for power-on-demand through wide operating range



Power Performance of LIMA'S New Optional Unit:

A.C. Electric motor with torque converter drive. [Diesel-torque converter curve (dotted line) shown for comparison.]
With this drive, even under extreme loading, the motor will pull down in speed only a very small amount. It can never be stalled. The line pull will constantly increase through a long pull down speed range, depending upon the load applied.



Power Performance of A.C. Electric Motor with Direct Drive:

The motor speed and torque vary as shown for line speed and pull

With a pull down in speed of only 3% to 5%, torque rises too fast The motor will stall quickly after peak torque is reached Workable speed range is small, stalls are frequent.

Lower First Cost — Reduced Maintenance

Now another quality-extra is available on all Lima machines. It's Lima's new electric power unit designed to give you full power-on-demand through a wide operating range.

Combining a single A.C. motor with a single stage torque converter, this drive matches, *electrically*, diesel-torque converter performance. It powers all motions and permits application of full power to any one motion as required. Under extreme loading, required power output is supplied at constant motor speed . . . and the motor can't stall or burn out.

The simplified electrical setup—with single A.C. motor and no complicated electrical controls—means lower first cost. Electrical maintenance is reduced to a minimum, and servicing does not require highly trained personnel.

Just check the performance curves above. You'll quickly see that Lima's quality-built electric power unit provides the ideal answer for *your* jobs calling for electrically powered machines. You'll get maximum power performance under all operating conditions. Get full details now from your nearby Lima distributor . . . or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

CAPACITIES

Shovels ½ yd. to 6 yds. Cranes to 110 tons. Draglines variable. Smaller capacities available on rubber.

Baldwin-Lima-Hamilton Corporation Construction Equipment Division also manufactures Austin-Western Crushing, Washing and Screening Plants at its Lima, Ohio plant . . . and Madsen Asphalt Mixing Plants and equipment at its La Mirada, California, plant.

BALDWIN BLH LIMA-HAMILTON

LIMA SHOVELS · CRANES DRAGLINES · PULLSHOVELS

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Cyanamid speaks his language

Our field engineers have worked side by side with him for more than forty years, throughout the world, wherever the mining industry operates.

We provide first-hand, in-the-mill assistance in the most efficient use of Cyanamid reagents. We help to solve difficult beneficiation problems . . . based on our comprehensive, continuing knowledge of ore-dressing advances the world over.

Ability to give mature and experienced technical assistance . . . as well as our complete line of flotation and cyanidation reagents and our long record of dependability . . . has made Cyanamid the world leader in metallurgical chemicals.

50 CYANAMID 1907 1957

AMERICAN CYANAMID COMPANY

MINERAL DRESSING DEPARTMENT

30 ROCKEFELLER PLAZA, NEW YORK 20, N.Y.

Marions Mine Iron Ore in the Wilds of Canada

Deep in a wilderness along the border between Labrador and Quebec, several Marion 4161 electric shovels load out high-grade iron ore to help feed steel furnaces all over the world. These 6-yard machines operate 12 months of the year —giving high output with minimum downtime in temperatures that fluctuate from summer's average 65° above zero to winter's average 20° below.

Heavy-duty construction of this ¾-yard Marion 35-M shovel matches the ruggedness of larger machines in the Marion line. For loading out coal—for any tough job—you need a durable machine. And there's a Marion to meet your need.

CONSULT **MARION** *MINING SPECIALISTS*
for lowest costs on your property!

MARION POWER SHOVEL COMPANY—MARION, OHIO, U. S. A.

NEW TEAMWORK IN
DIESEL ENGINE
DESIGN AND PRODUCTION

Last year American MARC Inc. purchased the Diesel Division of Hallett Manufacturing Company, national leader in development and production of low-horsepower Diesel engines (especially in the air-cooled field).

The goal of this combination of two great firms was to make better lightweight Diesels for less money—an end that has already been accomplished after only a few short months!

Today the position of the American MARC-Hallett team is stronger than ever. Foreign competition in both quality and price is now met successfully by American MARC's modern mass-production techniques in the manufacture of rugged, reliable, truly All-American Diesel engines.

Scores of improvements have made standard Hallett models into revolutionary new engines. This is true particularly in the case of the air-cooled 6 HP AC1, midget prime mover adaptable to almost any application—from generators to trackless ore cars.

If you need a husky small Diesel for industrial or marine use where extra lugging power is desired, write today to American MARC for free literature and specifications on these fine engines, with their small size, low cost, and modern refinements.

AMERICAN MARC INC.

ENGINES OF QUALITY

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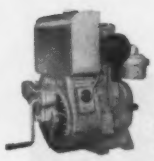
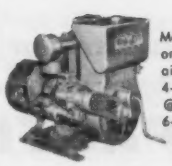
SOME desirable sales territories are still open.
Inquiries are invited from representative dealers.

- ★ **Air or Water Cooled; 5.5 to 25 hp**
- ★ **All-American, from basic materials to completed engines**
- ★ **Available as portable power units, generating plants, pumping units, or for marine propulsion**

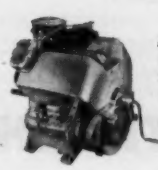
6-101



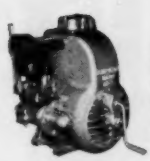
Model WC-1, one-cylinder, water-cooled, 4-cycle, 6 HP @ 1800 RPM. Wt.: 220 lbs.



Model A1Q-3KW, one-cylinder, air-cooled, 4-cycle, 3KW @ 1800 RPM. 6-7 HP



Model AC-2, two-cylinder, air-cooled, 4-cycle, 14 HP @ 1800 RPM. Wt.: 350 lbs.



Model AC-1, one-cylinder, air-cooled, 4-cycle, 6 HP @ 1800 RPM. Wt.: 220 lbs.

This large mine in the Coeur d'Alene area uses Bethlehem Pacific roof bolts of the slotted type, purchased through Bitco, Inc., Wallace, Idaho.

ROOF BOLTS

Improve Safety in Western Mines

You see more roof bolts in Western hard-rock mines these days. Besides protecting men, roof bolts cut down on lost production time. You can usually expect more tonnage, better ventilation, faster haulage, and other benefits when you bolt your roof.

Bethlehem Pacific makes two types of roof bolts: slotted bolts and square-head bolts fitted with expansion sleeves. The choice depends upon your local rock conditions. And we supply a full range of roof bolt accessories . . . hardened washers, roof plates— both square and triangular, flat or dished. The nearest Bethlehem Pacific sales office is ready to give you full details.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Sales Offices: Phoenix, Los Angeles, San Francisco, Spokane, Seattle, Portland

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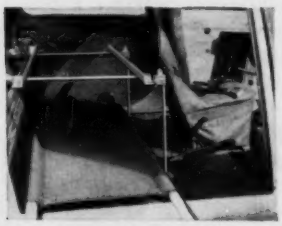
BETHLEHEM STEEL

EXECUTIVE INTERIOR APPOINTMENTS

INTERNAL ELECTRIC HOIST OPERATION

QUICK-CHANGE FLOAT INSTALLATION



TWO-PATIENT LITTER-KIT INSTALLATION

Presenting the **BELL RANGER**

Versatility Unlimited!

Newest of the famous Bell Model 47 family, the Ranger is truly an all-purpose helicopter with unlimited versatility.

This fast, powerful addition to the Bell fleet defies severe weather and rugged terrain. In a matter of minutes its luxurious executive interior can be converted to cargo carrier, aerial ambulance or rescue conveyance ...its internal hoist can be completely installed in five short minutes.

For the complete story of this great new four-place business aircraft, write, wire or phone...Sales Manager, Dept. JA-17, P.O. Box 482, Fort Worth, Texas.

BELL Helicopter CORP.

FT. WORTH, TEXAS

Subsidiary of Bell Aircraft Corp.

This reel means LOWER COST OF MINING FOR YOU!

Wherever you see the big yellow and black reel of Tiger Brand Wire Rope, you'll recognize another mining operation that's striving for lowest possible production costs.

For Tiger Brand Wire Rope provides greater safety, longer life, lower costs on every mining application.

Throughout the world—in Open Pits and Underground Mines, on Shafts and Slope Hoists, Draglines and Shovels, Tuggers and Slushers, Tractor Power Take-Offs, Car Spotters, Tramways, Churn Drills — wherever muck, tools, or equipment are moved... Tiger Brand ropes are on the job.

For every mining application there is a specially-designed Tiger Brand Wire Rope... proven in use to do the work with more safety and at lower cost.

To help you get the most out of your Tiger Brand Wire Rope, you're welcome to the free services of a Tiger Brand Field Engineer. For further information, contact your local distributor. You can get a free copy of the booklet "Longer Life From Your Wire Rope" by writing to Columbia-Geneva Steel Division, United States Steel Corporation, Dept. MWA, 120 Montgomery Street, San Francisco 6, Calif. So write today. No obligation, of course.

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UNITED STATES STEEL

How The Mineral Industry Advanced Technology In 1956

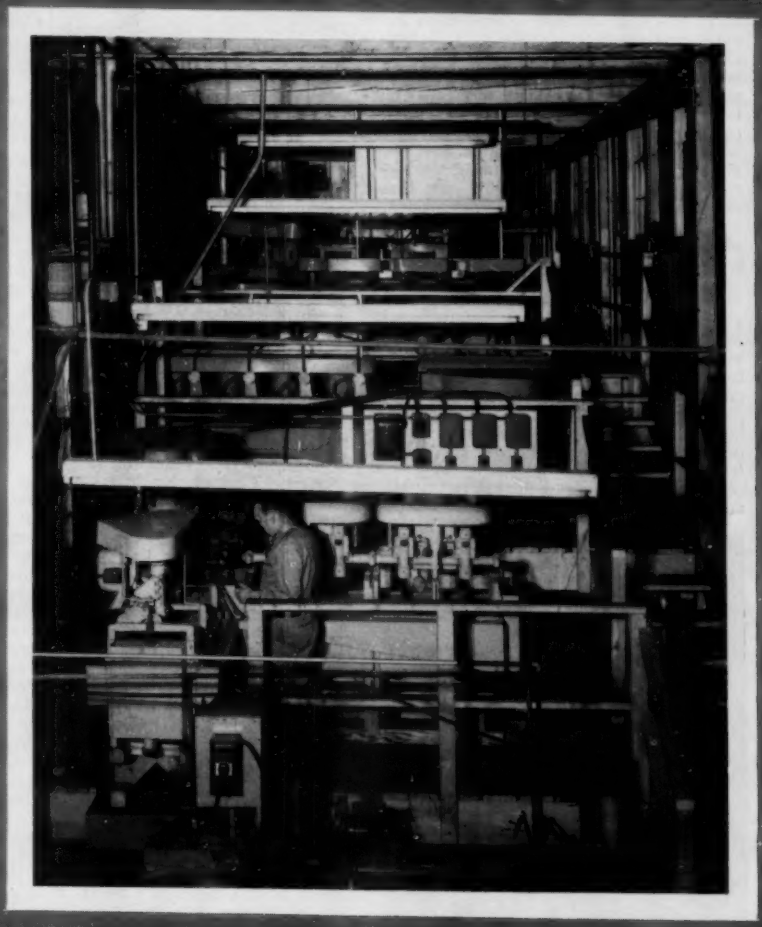
ORE TREATMENT looks to new processes say Colorado Mines Researchers...Page 24

MINERS strive to raise tons per man shift reports Ed Gardner . . . Page 39

URANIUM MILLS turn to solvent extraction according to H.L. Hazen . . . Page 44

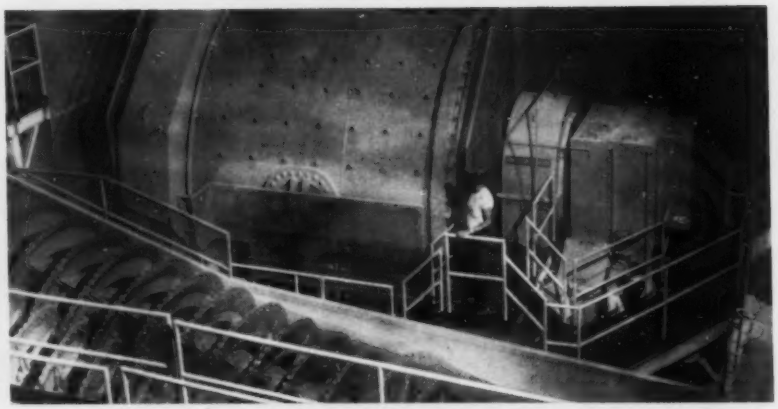
REDUCTION roast challenges iron metallurgists says S. E. Erickson . . . Page 47

EXPLORATION is now a group effort is the opinion of M. W. Cox . . . Page 52



Today's Era of New Metals and Processes Makes Float-Hydro-Pyro-Chem Metallurgy

By the Staff
Colorado School of Mines
Research Foundation*



LARGE-DIAMETER ball mills in closed circuit with spiral classifiers are the trend in large tonnage mills. This 13- by 12-foot mill operates with 72-inch duplex classifier.

The year 1956 in terms of metallurgy was highlighted by intensive development in uranium-recovery processes from the standpoint of both new equipment and new techniques. Chemical methods for recovering metals assumed added importance in the mining industry. The increased use of the cyclone separator continued to reface milling processes. More information was disseminated on the details of plant operations for the taconite processes in Minnesota. A review of other developments is as follows:

CRUSHING AND GRINDING: Although there was not a great deal published on the subject during the year, there was a great deal of interest in impact crushing versus conventional jaw-and-gyratory-type crushing. There were no reported advances in alloy development for impact-crusher breaker bars; however, the impact crusher is becoming quite widely selected in the industry where applicable. Several operations are either using or considering using the impact crusher for the total size reduction process without the use of a conventional grinding process. The outcome of these plants should make interesting study in the next two or three years.

A study of some of the fundamental aspects of size reduction by impact was given in a paper by R. J. Charles and P. L. DeBruan. The information developed should be useful in future design for the improvement of impact-type crushers.

With the ever increasing tonnages of both low-grade ferrous and nonferrous ores being ground in rod and ball mills, it is reasonably safe to predict that research in the grinding field will be greatly accelerated in the coming years in an effort to keep production costs down. The designs of newer grinding circuits show three general trends.

AEROFALL GRINDING at South African gold-uranium mill increased recovery.

In South Africa at East Daggafontein Mines, Ltd., the installation of a 17-foot-diameter Aerofall mill increased gold recovery as much as 4.2 percent and U_3O_8 recovery by 9.5 percent. In addition to the higher recoveries, a considerable reduction in reagent consumption and operating costs was achieved. The May 1956 issue of MINING WORLD carried the exclusive report on this unit. The increased metal recoveries and lower reagent consumption are attributed to the high degree of mineral liberation and/or selective grinding in the Aerofall closed circuit. This is in line with the many discussions about grinding for metallurgy rather than grinding for size reduction alone.

Union Carbide Nuclear Company reports lower maintenance and operating costs for the 12-foot Aerofall mills it has in operation in the Uravan, Colorado plant. The company is planning the installation of additional units in the future.

In the metal mining plants of large tonnage, the trend towards large-diameter ball mills continues at an accelerated pace. Though it has only been in operation a relatively short time, the 13-foot-diameter by 12-foot-long mill recently installed at Climax Molybdenum Company's mill at Climax, Colorado is proving up to all expectations. It is driven by a 1,000 horsepower electric motor. A duplex 72-inch spiral classifier operates in closed circuit with the mill. The benefits expected due to power requirements, throughput, and grinding ball consumption are very close to those predicted.

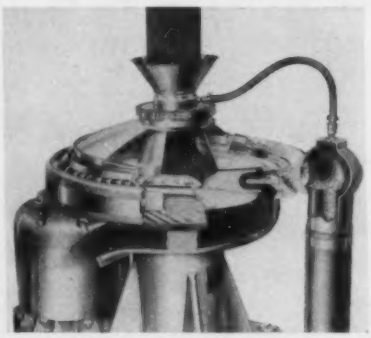
As a result of extensive testing of shell liners in ball mills at Climax, it is now the practice at this operation to use one type liner when mill capacity is the primary consideration and a different type liner for maximum economy during periods when excess mill capacity exists, according to a paper by Frank J. Windolph, mill superintendent.

At Reserve Mining Company's taconite concentrator at Silver Bay, Minnesota, about 5 pounds of steel is consumed per ton of taconite milled in the crushing and grinding units of the plant. This high steel consumption in conjunction with the large tonnages involved should provide the industry with a fertile field for large-scale research directed towards improved crushing and grinding units and improved grinding media.

According to Kennametal, Inc., tungsten carbide grinding balls in sizes ranging from $\frac{1}{16}$-inch to 2-inches in diameter are available for vibrating and tumbling mills. These balls are reported to show a wear life 60 to 100 times that of standard forged steel balls, and for equal ball volumes in a mill have shown roughly five times the throughput that could be achieved with standard forged steel balls. No plant operating data were available on the performance of these balls.

Several of the United States uranium producers handling loosely cemented sandstone ores were considering wet, open-circuit rod mill grinding without classification to grind material in preparation for leaching.

SIZING AND CLASSIFICATION: Dorr-Oliver has recently announced the production of the DSM screen adopted from the Dutch design. This screen apparently has high capacities in wet screening separations as fine as 200-mesh size. This screen is being used, and operating data should be forthcoming by the end of the year.



DRY CLASSIFICATION, at particle size, is possible with this air vortex unit.

Dry, particle size classification was given a boost at the beginning of the year by the introduction of the following devices:

*F. T. Davis, Manager, Ore Dressing Division; C. J. Lewis, Manager, Chemical Division; F. L. Smith, Manager, Mining and Special Products Division; E. H. Crabtree, Director.

These Judges Picked the Blue Ribbon Award Winners

BLUE RIBBON equipment developments of 1956 were picked by the industry leaders, shown above, as comprising the greatest contribution to the technology of the minerals industry. The judges selections were made from entries submitted by equipment manufacturers in the United States and abroad. Winners were chosen by the following judges. Seated from left to right are: Guy Bjorge, vice president Homestake Mining Co.; C. S. Davis, vice president, Utah Construction Co.; W. S. Reid, general manager, Selby, California smelter, American Smelting & Refining Co.; S. H. Williston, vice president Cordero Mining Co. In the back row, from left to right are: G. O. Argall, Jr., editor, MINING WORLD; A. E. Millar, general manager, The Anaconda Co., Yerington mine, Weed Heights, Nevada; S. H. Dayton, associate editor, MINING WORLD; and Peter Joralemon, consultant geologist. Awards given in the following categories are pictured on pages:

Ore Treatment ..... Page 37
Open Pit ..... Page 41
Underground ..... Page 43
General Equipment and Supplies ..... Page 49
Exploration ..... Page 51
Control and Laboratory Equipment ..... Page 45

1957

BLUE RIBBON MINING AWARD

To

for achievement in equipment development aiding the technological advancement of the mining industry.

AWARDED BY
MINING WORLD/WORLD MINING

PROGRESS THROUGH BETTER TECHNOLOGY

Sharples air vortex classifier, Hurricane Pulverizor Company high-speed classifier, and the Miproplex air classifier from Germany.

These machines are reported to operate at high efficiencies and comparatively high tonnages with the larger models. As yet, little operating data have been released for evaluating the new air classifiers.

A new countercurrent classification calculation method was described by E. H. Roberts and B. Fitch in their very outstanding article "Predicating Size Distribution in Classifiers." The practice of almost complete desliming by stage classification is becoming more common in various processes, and this method of computation should find wide application.

The practice of screening conventional classifier overflows to remove tramp oversize with Sweco screens is becoming more widespread.

Cyclones continue to be widely used for classification. The replacement of conventional spiral and rake classifiers with cyclones in primary grinding circuits was quite rapid during the year, particularly in the copper industries in the southwestern United States and in Africa.

The use of cyclones for preparing backfill, in building the berms of tailings dams, and in conjunction with filtering were reported during the year. The sand orifice control of the Krebs cyclone offers an easy method of control to the cyclone operator.

The Esperanza classifier is being used in some desliming operations in the uranium industry particularly with corrosive pulps. Evidently, acid proofing of this type classifier is less expensive than for the more conventional type classifier.

FLOTATION: An interesting article on the flotation and processing of the rare earths minerals from Molybdenum Corporation of America's Mountain Pass, California mine was published in the January 1956 issue of MINING WORLD. The process involves heated conditioning with fatty acid, flotation, and then chemical treatment and roasting of the concentrates.

There is considerable curiosity in regard to Nathaniel Arbiter's oxide copper flotation process, but evidently little information will be available until patent arrangements are cleared up.

A. M. Gaudin prepared an article in which the flotation of sylvinite and sylvite in saline solutions was discussed. Considerable phenomena, that require more scientific inquiry and investigation, were pointed out in this specialized type of flotation process.

S. C. Sun and P. E. Morris reported on sodium dihydro orthophosphate used with sodium silicate as an effective depressant of limonite, geothite, calcite, and clay during the fatty acid flotation of manganese minerals.

The relation of flotation rates to cell impellar speed and air volume was discussed in a paper by W. R. Horst and T. M. Morris.

A number of papers on the flotation of uranium ores were published during the year by B. C. Mariacher, A. B. Van Cleave, and John N. Butler.

The flotation operator should enjoy reading the "Forum on Flotation" by the Flin Flon staff and W. H. Maler published in the December, 1956, *Canadian Mining and Metallurgical Bulletin*. The operation of Hudson Bay Mining and Smelting Company's Flin Flon pilot flotation arrangement for testing different flowsheets and reagents is discussed. Maler makes a very interesting commentary on parallel flotation cell arrangements versus series cell arrangements. The discussions from the floor are noteworthy in this publication.

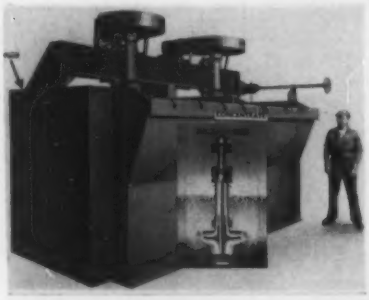
E. B. Douglas reported on flotation at Calera Mining Company's Black Bird, Idaho mines for copper, cobalt, and iron. This process involves flotation of copper, followed by flotation of iron sulphides, and finally sulphidization and flotation of cobalt minerals in an acidic pulp.

W. H. Hamilton and H. Tessels reported on the White Pine Copper Company's flotation process in which the primary flotation tailing is cycloned, followed by scavenger flotation of the cyclone sands.

Sim, Snow, and Purcell reported on flotation characteristics of Florida phosphates ores, discussing the many variables and their effects in this process.

Fast, Laton, and Stevens presented a paper on the investigations of the leach-precipitate-float process for the semi-oxidized ores of Kennecott Copper Corporation's Ray, Arizona, deposits.

Very significant advances are expected in nonmetallic flotation because of the possibility of almost complete desliming with staged cyclones prior to flotation. Very significant gains in this field have



GIANT FLOTATION machine with 72-inch cells. Operators await performance data.

been reported on certain ores that in the past have proven difficult to float when only partially deslimed.

The giant 72-inch Denver Equipment Company's flotation cell excited considerable discussion. Flotation operators are eagerly awaiting performance data on this machine.

DEWATERING: The study and advancement of liquid-solids separation received a great deal of attention during the year, although not much was published on the subject. The choice of employing a countercurrent-decantation thickener system, or the resin-in-pulp (RIP) process, or washing on drum filters, is one of the more important decisions to be made in the design of a uranium mill. The usual need for acid proofing this equipment further complicates the picture. Some plants either thicken or contemplate thickening material as coarse as minus-14-mesh size by "beefing up" thickener mechanisms. The purpose of this practice is to eliminate the necessity

SCREENING of classifier overflow to remove tramp oversize grows in importance.

of separate sand and slime washing circuits. No clear picture of this practice is presently available. Separan continues to be widely used as a flocculent in both settling and filtration. More attention is being given preparation of pulps prior to either the thickening and filtration steps, particularly in the uranium industry. For example, the type of agitation used in leaching frequently has been found to have a profound effect on thickening and filtration characteristics. The use of Versenes for periodic cleaning of filter media has received some very favorable reports.

New filtering and drying devices common to the chemical industry are being adopted in the ore milling field. The drying of high-value uranium concentrates has received considerable attention during the year. The major problem in this process is dust losses. The smaller mills are still batch-drying pans of concentrates in ovens. Among the dryers being either used or experimented with are the Proctor-Schwartz, the Holo-Flite, and the Blaw-Knox. There is no unanimity of opinion of these dryers, even for use on the same product.

GRAVITY CONCENTRATION: A comprehensive account of dry concentration methods, past and present, was presented by C. T. Sweet before the Cornish Institute of Engineers. The Vibrain dry concentrating table is evidently finding wide usage in the arid regions of Africa.

A novel heavy-media process for the concentration of iron ore was reported from the Stripa Mines in Sweden. This plant operated about a year using a heavy-media bed moving towards the discharge end of a shaking trough. Higher-grade concentrates and better recoveries were obtained when using this method than when using conventional heavy-media processes.

The Wemco-Remer jig was exhibited in Los Angeles, California. The area of the bed of this jig is quite large—up to 80 square feet. The jig employs two distinct vibrations for the jigging action and evidently has quite a high capacity. The jig is being used in the industry, but no published performance data were available.

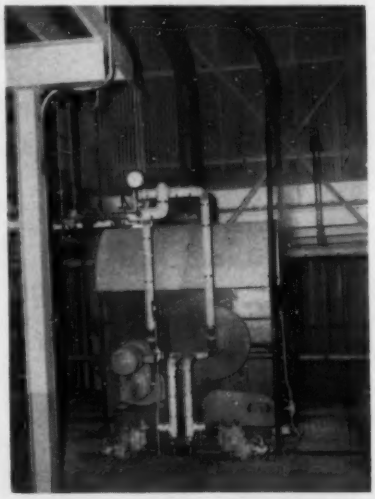
The effect of operating variables of the Driessen cone heavy-media concentrator was discussed in an excellent paper by E. O. Filge. His work indicates that ½-inch by 100-mesh ore feed is suitable for cyclone concentrations and that media consumption is in range with that of the older processes.

A comprehensive report of a study of the depolarization of magnetite pulps encountered in heavy-media processes was given in a paper by M. F. Williams and L. G. Hendrickson. A method of measuring the effectiveness of depolarization was described in this paper.

Stearns Magnetic Company exhibited its new wet-drum magnetic separator. No new principles are involved in this separator. The tendency in this type separator appears to be to the use of Alnico magnets instead of electromagnets.

AUTOMATION AND CONTROLS: The use of automation is making steady, if not spectacular, advances. Almost all new plants employ more automatic control. Automatic pH control is becoming fairly well standardized. New pulp density controllers or measuring devices were reported during the year. One of the more interesting control devices reported is the Density Gammagage. This device operates on the differential penetration of gamma rays through pulps and ore streams in pipes and containers according to their density, concentration, etc. An interesting application of control in the grinding circuit at the Marmora Mining Company's Ontario, iron ore concentrator utilizes the vacuum produced in the cyclone classifier. None of these seem yet to be universally applicable. The control and measurement of the fluosolids roasting process is very well developed in the automation field.

ULTRASONICS: Laboratory experiments by Sun and Mitchell have shown



HIGH-VALUE uranium concentrates are dried on this gas-fired, drum-type unit.

that it is possible to stratify mineral particles in water by ultrasonics. By using this principle they have been able to deslime and upgrade ore and slime tailings of fine particle sizes. Small-scale tests of tungsten and tin samples have shown promise, but tests with larger equipment are necessary for verification of the process. One of the advantages of the process is that flocculated fine particles are disintegrated by the ultrasonic waves, thus eliminating one of the most troublesome aspects of handling slime material.

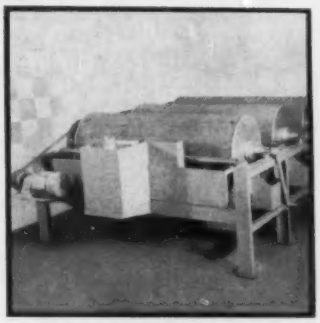
MATERIALS HANDLING: D. J. Reed Jr. reported on the interesting use of high-speed photography in the correction of troublesome conveyor transfer points. Also, the results of Hewitt-Robbins-sponsored research on conveyor belt design at Pennsylvania State University was reported in an article by A. W. Asman. This article is interesting reading for the materials handling engineer.

GENERAL: A very good insight was obtained into the magnitude and the types

PROGRESS THROUGH BETTER TECHNOLOGY

Blue Ribbon Equipment Awards for 1957

ORE TREATMENT



THUNES SEPARATOR

This further modified Permanent Magnetic Separator has new stainless nonmagnetic steel box, pulp distributor with no feed shock.

Circle No. 1 on the inquiry card.

FLOTATION REAGENT Z-200

The new Dow sulfide reagent is an improved selective collector for copper and zinc. Recommended for copper-pyrite separations.

Circle No. 2 on the inquiry card.

TIW SAND PUMP

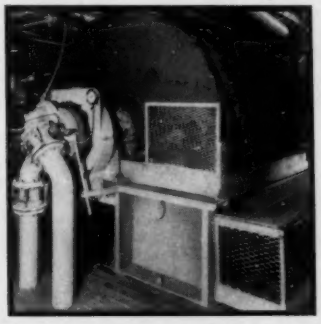
Developed by the Telluride Iron Works Co., this 1½-inch by 1½-hp pump features a non-clogging impeller and large diameter bowl.

Circle No. 3 on the inquiry card.

DOUBLE WAVE LINERS

New American Brake Shoe Company ball mill liner design increases grinding efficiency by causing a greater cascading of balls.

Circle No. 4 on the inquiry card.



SWING FILTER AGITATOR

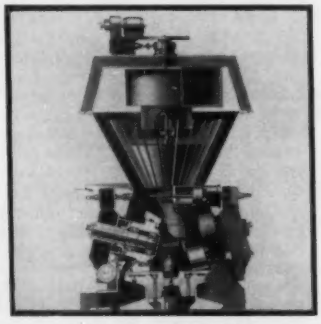
This newly developed swing-type agitator for Dorr-Oliver's American Filter assures uniform agitation throughout filter tank.

Circle No. 5 on the inquiry card.

SOLUTION FLOW MONITOR

This WEMCO unit regulates flow of eluant and IX feed in RIP section of uranium reduction plants. Eliminates complex valve system.

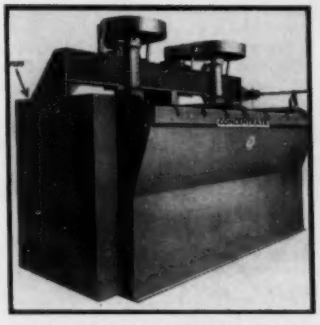
Circle No. 6 on the inquiry card.



DISC ROLL MILL

Designed for grinding soft materials, the Hardinge roller-type mill features pneumatic grinding roll pressure control.

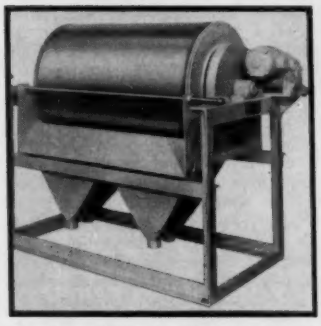
Circle No. 7 on the inquiry card.



"M" FLOTATION MACHINE

Designed to handle large tonnage flotation, this Denver Equipment unit employs use of both entrained and dissolved air.

Circle No. 8 on the inquiry card.



STEARNS SEPARATOR

Improved Stearns separator unit was specifically designed for a highly efficient recovery of the ferrosilicon media in HMS plants.

Circle No. 9 on the inquiry card.

of processes used in the beneficiation plants on the Mesabi range by those who viewed the motion picture description of the E. W. Davis works of the Reserve Mining Company. This picture was produced by company personnel, who should be complimented on the production of an excellent visual education source for this phase of the industry.

By way of developments of a chemical or chemical engineering nature in 1956, elements, processes, and equipment shared the limelight about equally. The expansion of lithium and lithium chemicals production is noteworthy. One of the largest of these expansions was the Bessemer City, North Carolina, development of the Lithium Corporation of America. The unique feature, reported to be the key piece of equipment at Bessemer City, is the rotary "decrepitation" kiln for converting naturally occurring alpha spodumene to the acid soluble beta form, thus eliminating any need for concentrating the raw lithium ore. The plant was described in the February 1956 issue of MINING WORLD.

Columbium and tantalum received special attention in 1956. The U. S. Bureau of Mines announced a revolutionary new method for recovering tantalum and columbium from ores, concentrates, or smelter slags. This process is based on the use of highly selective organic solvents and mineral acids for separating these two elements by the liquid-liquid extraction technique. In connection with the growing interest in these metals, it is noted that Fansteel Metallurgical Corporation embarked on a $1,000,000 expansion program for tantalum and columbium. This process involves caustic fusion of the ore concentrate, followed by acid leaching, fluoride precipitation, and fractional crystallization. However, it may be noted that in spite of this expansion, Fansteel is building, in a different location, a new unit which will use a liquid-liquid extraction method for separating these two elements.

Process development and production of titanium, zirconium, tungsten, nickel, boron, sodium, potassium, aluminum, selenium, and magnesum attracted more than usual attention during the year 1956. Electro Metallurgical Company's step into titanium sponge made it the first in the field without a government procurement guarantee. Its 10,000,000-pounds-per-year plant at Ashtabula, Ohio, scheduled to be in full production by the end of 1957, will use sodium to reduce titanium tetrachloride to sponge by a new process. It may be noted that the National Bureau of Standards is reported to have successfully electro-deposited protective coatings on titanium, which development may well lead to the further use of titanium in many equipment applications, particularly at high temperatures.

With reference to zirconium, another entry, Kennecott Copper Corporation announced plans to built a pilot plant to produce granular zirconium by an electrolytic process at Bedford, Ohio.

Salt Lake Tungsten Company at Salt Lake City, Utah continue to pilot production of ammonium paratungstate. Whereas the process itself is not new, the Salt Lake City operation makes use of low-grade sodium tungstate liquors instead of the usual high-grade tungsten concentrates.

In the field of nickel technology, new minerals-beneficiation techniques and processes employing liquid-liquid extractions were further explored in 1956. Falconbridge Nickel Mines Ltd. continued an expansion program designed to increase nickel capacity to 55,000,000 pounds or more by 1960. Expansions of nickel capacity in Cuba by the United States government continued, and Freeport Sulphur Company announced a pilot nickel-cobalt recovery process from ores at Moa Bay, Cuba. Pacific Coast Borax Company announced plans for expanding production of borax, as well as boric acid and other specialty products. The possible application of alkali-metal borohydrides as rocket fuels and the applications for the element in the Atomic Energy program gained increased interest. Both Pacific Coast Borax and American Potash and Chemicals Corporation continued to emphasize the development or organo-boron compounds.

Sodum and potassium, particularly the former, enjoyed technological progress in 1956. A changeover from magnesum to sodium as the preferred reducing agent for titanium production is noteworthy, as is the research emphasis on the manufacture of sodium by the thermo reduction of soda ash with coke. The advent of low-cost sodium further decreased the industrial use of potassium in 1956. But the process wherein molten potassium chloride is contacted with sodium vapor in a distillation column, to produce sodium potassium alloys or pure potassium, continued to hold attention.

Developmental work on aluminum production was apparently augmented in 1956, and with success, for it is reported that processes previously limited to around 8.0 percent silica in the aluminum feed can now tolerate up to 13.0 percent silica. Work of Harvey Aluminum Inc.'s 54,000-tone aluminum reduction plant at The Dalles, Oregon, was resumed with completion scheduled for late 1957. However, interest in aluminum was particularly characterized in 1956 by the expansion in prospecting for bauxite ore bodies on a world-wide basis. As to magnesium, it may be noted that the first company to go into magnesium production since the war is being formed by Brooks & Perkins, Inc. to operate at Selma on the Alabama River using dolomite, not brine, as magnesium source.

Interest in selenium in 1956 continued at a high level but with practically all emphasis on locating and developing additional sources of this important element. It is reported that Shawano Development Corporation continue to develop a selenium project near Baggas, Wyoming, based on discoveries made at the University of Wyoming.

SOLVENT EXTRACTION: If 1956 can be characterized by any one single hydrometallurgical development, it would be that of solvent extraction, or as this technique is frequently called, liquid-liquid extraction. Application of this relatively new technology to processes for the recovery of uranium, in particular, and vanadium, rare earths, molybdenum, tungsten, nickel, cobalt, and cadmium continued at an accelerating pace.

Solvent extraction investigations on rare earth separation and concentration were investigated rather broadly. The Colorado School of Mines Research Foundation applied solvent extraction to the recovery of yttrium. The Ames Laboratory reported solvent extraction to have some advantages over rare earth separation by ion exchange, especially for rare earth compounds of less than spectrographic purity. In this developing field, the organo-phosphates continued popular although a considerable amount of investigational work was launched to develop amine extractants. Texas Zinc Minerals Company selected an amine extractant for use in conjuction with the Podbielniak continuous extractor for uranium.

Throughout 1956 there was an accelerating pace at which both chemistry and chemical engineering principals found application in hydrometallurgical developments and processes. This reflected the speculation, imagination, and vision surrounding this long-overdue merger of metallurgical and chemical technology. Chem-metallurgical innovations too numerous to mention in the foregoing brief summary resulted, and will no doubt lead to important new development and major new industries in the years ahead. Among such developments, which may be given only passing notice, was the selective depressant for copper and iron in molybdenite flotation, and a selective collector for copper and copper-activated zinc materials. This last reagent, an alkyl thionocarbamate, is reported to be the most selective collector known for copper and copper-activated zinc minerals.

Another development of more than passing interest is that of the high-intensity arc procedure for vaporization of the most refractory metals followed by a condensation and collection. In this procedure an ore target is bombarded with an electron stream to produce temperatures reported as high as 18,000°F. In this same category it may be noted that chlorination processes also continued to be widely investigated. The U. S. Bureau of Mines at Albany, Oregon, continued studies to recover tantalum and columbium from Idaho's "black sands" by a chlorination procss.

Even the usually humble clays and, in some cases, worthless tailings were investigated as possible sorbants and scavengers for water-borne radioactive wastes.

In addition, 1956 witnessed further strides in zone refining and the development of construction materials to withstand ever higher temperatures. The zone refining principal uses induction heating to move a molten zone through a metal specimen. Crystallization of the more pure phases in the wake of the melting zone drives unwanted impurities forward for concentration in the final heated area of the specimen.

National Carbon Laboratories began studying titanium diboride, "called the hardest material that does not exist in nature ever made by man." This and other refractory developments forecast the application of operating temperatures that not many years back would have been deemed fantastic.

Finally, 1956 witnessed an increased awareness of the dimishing supply of usable water and the necessity for augmented water conservation programs. There were more installations for the re-use of industrial water and additional legislation at both the national and state level designed to conserve and improve water resources.

Where float-hydro-pyro-chem-metallurgy will go in 1957 is hazardous to predict. As someone has already observed, there has been a cross-fertilization of these technologies resulting in vigorous new technologies which must ride the crest of the Atomic Age.

Refinements In Mining Methods and New Machines Raise Tons Mined Per Man Shift

By E. D. GARDNER
Consulting Mining Engineer
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Arlington, Virginia

No outstanding developments in mining technology were reported during 1956, many improvements in practice and equipment were noted. The trend in the mineral industries during the year continued toward greater mechanization and improved procedures to increase the tons mined per man-shift.

Open pit mining profits by equipment developed for all types of earth moving jobs. Improved models of off highway trucks, loading equipment, bulldozers, and graders were announced during the year.

Churn drills have been the standard machines for putting down blast holes in open-pit mines and quarries for many years. Many improvements have been made in the last three decades in the drillings rigs, and in the drilling and blasting practices. The diameter of the holes has been steadily increased from 4 and 6 inches up to 12¼ inches. During the past few years rotary drills developed by the oil industry using tricone bits have been replacing churn drills in open-pit mines and the trend continued during 1956. The drilling rate is up to five times that of the replaced churn drills. Bits continue to be improved since the rotary drill has moved into the metal mining field; further improvement is expected.

After a long test period, rotary drills were being introduced on the Mesabi Iron Range in 1956. The problem of rotary drilling on the Range was not of the drill but of bits. At the start it was found that the bit life of a 6¾-inch hole made with 8¾-, 9⅞-, and 12-inch bits. Later tests indicated that the rate of drilling with the rotary drill was four times that with the given standard churn drill. Comparative tests with drills using 8¾- and 9⅞-inch bits indicated an advantage of the larger sizes.

A rotary drill developed by the oil industry for drilling relative small diameter holes for "shot holes" in siesmic geophysical examinations has been adopted by the metal mining industry for putting down exploration holes. These drills also have replaced pneumatic air drills at a few small mines for blast holes.

A drilling rig with a compressor as an integral part is becoming standard at mines where pneumatic drilling is done.

TRACTOR-mounted compressor and drill used for block holing in open-pit mine.

Jet piercing is used for putting down primary blast holes at the Reserve taconite mine in Minnesota. Fifty percent of the explosives are loaded into the lower one-third of the hole. A series of 1½ inch shallow holes are put down with air drills around the main holes and shot simultaneously with the primary blasts. These secondary holes have greatly improved fragmentation, as previously large unbroken blocks of taconite had a tendency to ride out unbroken by the primary blasts. Jet piercing is also used for blast holes in syenite at a quarry in Arkansas.

The use of new relative low cost explosive comprising ammonium nitrate and carbonaceous material increased during the year in surface mines and quarries. Improvements also were made in the manufacture of the explosive. A late development has been the use of pelletized ammonia nitrate of fertilizer grade with added Diesel oil or used motor oil. It has replaced conventional explosives at some mines with favorable results.

AMMONIUM NITRATE with added Diesel oil cuts blasting cost in this copper pit.

Milisecond denoators with primacord lines are increasing in use.

The trend in stripping shovels and draglines has been toward larger and more powerful machines culminating in the "Mountaineer" shovel which was put into regular service in 1956 by the Pittsburgh Consolidation Coal Company. This shovel has a 60-yard bucket and overcasts 2,000,000 yards a month. Larger machines are on order. Stripping by overcasting the spoil has been mostly confined to strip coal mining but this system of uncovering mineral deposits is used in the phosphate industry in Florida and to a less extent in other places.

Shovels of up to 7-yard dippers mounted on a single set of crawlers are preferred in most large tonnage metal mines. The shovels are relatively mobile.

Improved over-cast and front-end loaders replaced shovels at some small and moderate tonnage mines and quarries during the year.

Rubber-mounted tractors are of increasing importance in surface mining. One recent new use is for spotting railroad cars.

Wheel excavators working on the same principle as a gold dredge have been in use in Germany for many years and have been introduced elsewhere. They are used principally for handling unconsolidated material but shale and other similar materials are dug successfully in Germany. Several wheel excavators are in use for stripping coal in Illinois.

Rail haulage holds its own at the older porphyry copper mines but trucks are used for some stripping jobs at these properties. Truck haulage is used at all of the open-pit copper mines opened up since the Morenci mine of Phelps Dodge Corporation was developed in the late 1930's.

Trucks with 75-ton capacities are in use and 90-ton units are in the development stage. For the past few years trucks in the 22- to 34-ton range have been favored at large tonnage metal mines. This size also appeared to hold in favor during 1956 although some replacements have been 50-ton models. New models show improvements in design for lower operation and maintenance costs.

The Pittsburgh Consolidation Coal Company's 110-mile, 10¾-inch pipe line from southeastern Ohio to Lake Erie was completed during the year. The capacity is expected to be 1,300,000 tons of coal a year in a 50 to 50 coal-water mixture. A plan to pump copper concentrate through a 15-mile, 5-inch pipeline from the new El Salvador mine in Chile to the railroad at Potrerillos has been announced. The American Gilsonite Company is building a 71-mile, 6-inch pipeline in Utah and Colorado for transporting a gilsonite slurry. The line crosses a pass 3,000 feet higher than the starting point.

Maintenance of equipment is being given more attention by the mining industry. Periodical inspection and systematic maintenance programs have shown a reduction in mining costs.

MINING METHODS: The various mining methods in use have been established for many years. The general methods, however, have been modified over the years and continue to be improved to fit new procedures and new equipment; mining practices continue to be improved. New procedures have permitted the mining of some ore bodies by a less expensive method than the one

Mr. Gardner was formerly chief mining engineer for the U. S. Bureau of Mines.

formerly used. As an example, the use of rock bolting, improved drilling practices, and a more efficient manner of handling the broken ore has made practical the substitution of cut-and-fill stoping for square-setting with an appreciable saving in stoping costs at some mines. Rock-bolting also has permitted the mining of some ore bodies by shrinkage instead of the more expensive cut-and-fill method.

During recent years block caving has been replacing other methods for mining bodies of soft ore, especially in the underground iron mines. Improvements in the application of the method and in procedures are being made. The trend at the western mines using block-caving is to replace the grizzly levels with scraper drifts.

The Crestmore, California mine of the Riverside Cement Company came into production during 1956. A thick strata of limestone that dips 45 percent and lies below the water table of the Riverside area is being mined by a room and pillar method. Egress to the mine is down a 10 percent entry in the footwall. The mined stone is hauled up the slope. This appears to be an innovation for mining this type of deposit.

The continuous miner developed for mining coal is being used in potash, salt, and bauxite mines. A rock planer is being developed by the U. S. Bureau of Mines and the Montana Phosphate Products Company. It shows promise of being effective in dipping beds.

With the advent of improved practices and equipment, the trend in recent years has been toward the production of the required tonnage or ore from fewer working places. This has resulted in lower development and maintenance costs and better supervision besides greater production per man-shift in the stoping areas.

SHAFT SINKING: Shaft sinking practices continued to be improved during the year. Jumbos for mounting sinker drills are now on the market; they are an aid in drilling blue print rounds and also increase drilling efficiency.

Clam-shells are generally used for digging the blasted material in shaft sinking. Several procedures for manipulating the loading units are in use. A newly developed loader (Cryderman) is gaining in use; the clam-shell is actuated by a hydraulic boom mounted beneath the operators cage. A crawler-mounted overshot loader which came on the market in 1956 (Eimco 630) has been used with favorable results in loading the broken material in shafts of 18 feet or over in diameter. Ventilation and small working shafts were sunk with coring rigs on the Colorado Plateau.

DRILLING AND BLASTING: Jumbos—The machinery companies brought out improved methods of jumbos for drilling horizontal openings. Four-drill jumbos that can be operated by two men are in use for large headings. One such model mounts four drill slides on masts and permits drilling accurate blue print rounds in high headings; the compressor to furnish air for running the four drills is an integral part of the machine.

The jack-leg has an established place in underground mining. The old column mounting for drills has nearly passed from the scene. The choice now for any particular working place is between a jumbo and a jack-leg. The principal use of column mounts now is for long hole drilling.

Drills—Pneumatic drills still hold their own in metal mining; they have been improved over the years and refinements still are being made. Before World War I diamond drills were largely used for drilling long blast holes, but, because of the high price of diamonds and improvements in jointed drill rods, air drills now have largely replaced the diamond drill for this type of work.

Rotary drills are commonly used for drilling blast rounds in coal, salt, and potash. Progress is being made in the development of rotary drilling in harder material; the principal problem is bits.

A rotary-percussive drill has been introduced in Germany that has reported twice the drilling speeds of a rotary drill and several times that of an air leg percussive drill. Progress has been made in bit design for use with the rotary-percussive drill but further improvements are desired.

Bits—The advent of carbide bits has permitted the use of one-pass drill-rods for drilling blast holes with greatly increased drilling efficiency; longer rounds also can be drilled. Carbide bits continued to be improved during the year. As a result of a two-year testing program at Climax Molybdenum, three definite recommendations were made to bit manufacturers for improvements in bit design; two of the recommendations permitted faster chip removal—the third increased the life of bits. A detachable carbide bit with a tapered socket was introduced in United States mines during the year for use on air-leg drills.

Carbide-tipped drill steel is used only at a relatively few places in the United States but it is employed entirely in Sweden. Experience has shown that this type of bit is the most economical for Swedish conditions. The life of the rod and the bit is generally the same in terms of footage drilled. The drilling rate with the integral steel is higher and the life of the rods are longer than those used with threaded bits.

The improvements in bits during the last few years have been noteworthy but further improvements in bits is desired by the mining industry. Efforts to produce better bits are being made on both sides of the Atlantic Ocean.

Drill Rods—In these days of mechanized mining and high prices of steel, the quality of the steel used in drill rods is a much discussed subject among mining men. Drill rods are an important item of expense in drilling rounds; in some cases it is the largest single item.

DIESEL-POWERED, front-end loaders are used in underground lead-zinc mines.

Improper handling of drill rods by the users and inexpert fabrication are, of course, frequent causes of rod failures. Most breaks occur near the ends of the drill rods. More mining companies have programs for careful handling of the drill rods to prevent nicks or rusting. Longer lasting drill rods is desired by most operators.

Drill Rounds—With modern mining machinery, long blast rounds are desired to provide larger tonnages to fit the capacities of the machines. The burnt-cut round has found favor for driving development headings as deeper rounds can be broken than with the older conventional patterns. Experimentation continues to improve burnt cut rounds to fit particular conditions. The use of a large diameter relief hole, which is not loaded, is gaining. Loading of the holes to improve fragmentation is used in Sweden.

Blasting—The trend in loading blast holes is to select the largest diameter cartridge that can be readily pushed into the hole; a hole drilled with a single carbide bit has nearly the same diameter throughout the hole. The use of such cartridges permits denser loading and also cuts down the tamping time. The trend is also to use longer cartridges for the same reasons. Lengths up to five feet are used in Sweden.

The time required to charge large rounds is important especially where a tight cycle is in effect. The Swedes developed a method of loading and tamping the holes mechanically a few years ago and in 1956 a similar method was announced by a United States inventor. No accidents attributed to mechanical loading has come to notice but most operators appear to be waiting until the safety of such devices are assured. Tests in Sweden indicate the density of the explosive charge is greatly improved by the use of the loading machine.

Boring machines are being used for extending headings in such material as chalk.

LOADING: Standard loading equipment as used in surface mines is preferred where conditions permit. Electric shovels with dipper capacity up to 3 yards with their low maintenance and operating costs are preferred where there is sufficient working room and the tonnage to be moved justifies the first cost. Of late years, Diesel-powered loading machines have been taken underground with trackless mining. Electric or air operated loading machines operated on mine tracks have been in use for many years.

The choice of loaders to work under backs of 15 feet or less has been limited. New machines came on the market during 1956 for handling moderate tonnages in workings with relatively low head room. A crawler-mounted overshot loader (Eimco 620) operated by compressed air will work under a 9-foot back. Front-end, Diesel-powered loaders which will work under 7-foot heights are also now on the market. A new model of a Diesel-powered, over-shot loader (Eimco 105) with a relative high capacity will work under a 12½-foot back.

Portable slusher units have been in use for years for loading ore in flat stopes and are still preferred in some mines. They will work under relatively low

backs and have low first cost and low maintenance cost. Slushers are commonly used for pulling ore to chutes.

An electric-powered loader developed for handling coal has been adopted for use in some rock mines. It has a relatively large capacity and will work in narrow rooms with low head room. The disadvantages are relatively high, first cost, high maintenance cost, and relative poor mobility.

HAULAGE: Haulage remains one of the major items of expense in underground mining. A haulage system is generally desired that permits a minimum of re-handling of the material being moved.

The use of Diesel trucks continues to expand in underground mines. Trucks generally are replacing track haulage where the conditions are favorable. One of the principal savings with trucks is that they are more maneuverable than cars on a track and thus permit more efficient loading. Where height permits and ventilation is adequate, trucks have shown themselves to be the most economical mode of relatively short-haul transportation. They also can compete with rail or belt-conveyor haulage on relative long hauls where the indicated mine life is short, the daily ore requirements are relatively small, or the haulage gradients and directions are complex. The experience of the Minerva Oil Company with trucks feeding belt conveyors at its No. 1 fluorspar mine in Hardin County, Illinois has been toward keeping the belts shorter and letting the trucks haul farther than previously. The Indian Creek mine of the St. Joseph Lead Co. was developed for truck haulage. The haulage drifts are 14 feet wide but have a limiting height of 6 feet. The first trucks used from other mines of the company have a capacity of 6 tons, are 6½ feet wide and 4½ feet high. The newly designed 10-ton truck using standard parts is to be used as the principal hauling unit; it is 8 feet wide, 20½ feet long, and 5½ feet high. One truck is expected to haul 250 tons, 2,000 feet per shift, for 17¢ per ton.

PROGRESS THROUGH BETTER TECHNOLOGY

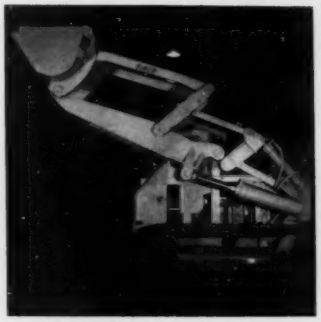
Blue Ribbon Equipment Awards for 1957

OPEN PIT

DRAGLINE BUCKET LINE

A special steel alloy gives this new line of Bucyrus-Erie Buckets high impact resistance, even at low temperatures.

Circle No. 10 on the inquiry card.



EIMCO 105 LOADER

Eimco's new Front-End Loader has 25,000 pounds digging force, and 40,000 pounds "pry-out" force at bucket lip. Has 2½-yard bucket.

Circle No. 11 on the inquiry card.

MICH GAN TRACTOR-DOZER

Clark Equipment Co.'s new 375-hp Tractor-Dozer has ample power to bulldoze as well as to push-load scrapers. Weighs 62,000 pounds.

Circle No. 12 on the inquiry card.

HI-LIFT STRIPPING SHOVEL

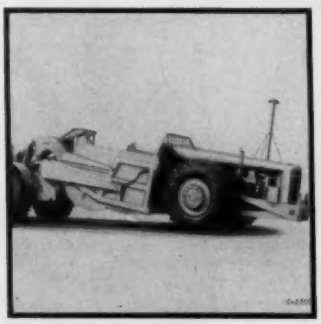
New Model 1205 Stripping Shovel developed by Koehring Co. can be converted from shovel to a lift crane, dragline or clamshell.

Circle No. 13 on the inquiry card.

35-TON END DUMP TRUCK

Dart's new 35-ton End Dump Truck features a Cummins 400-hp Diesel engine, and three stage converter with downhill braking.

Circle No. 14 on the inquiry card.



TS-24 TWIN-POWER SCRAPER

Euclid's new 24-cubic yard struck capacity unit uses two engines, each driving separate axles with separate Torqmatic drives.

Circle No. 15 on the inquiry card.

ELECTRIC-POWERED, 30-ton truck used at the underground limestone mine of the Riverside Cement Company at Crestmore, California. Operates on grades to 12 percent.

At the new underground limestone mine of the Riverside Cement Co. at Crestmore, California, the broken stone from the rooms is hauled in 30-ton, electric-driven trucks up a 10 percent grade at 12 miles per hour. The trucks operate under a standard trackless trolley system. The overall haul is about one mile. Electric drives were chosen instead of standard Diesel engines as an aid to better air conditions underground.

Truck roads underground as on the surface have a bearing on trucking costs. More attention is being given to road maintenance in underground mines. The Minerva Oil Company considers that where 1,000 tons is hauled per day over a road, a daily trimming with a grader or motor patrol will pay in savings on delays and repairs to the trucks. A handy supply of gravel for road surfacing is highly recommended and often is introduced to working areas through drill holes.

A combined loading and haulage machine named a Gismo, which also mounts a jumbo for drilling, has proved efficient for hauls up to 300 to 600 feet and in areas of restricted working room. It loads 5 or 6 tons at a time, can handle up to 700 tons per shift. The machine is gaining favor where the conditions favor its use. Front-end tractor loaders are used to transport their loads for short distances or to transfer points on the surface. Like the Gismo, the practical transport range is limited. Small track-type tractors are used in some uranium mines on the Colorado Plateau for hauling ore in trains of rubber-tired wagons. They have an advantage for relative small tonnage from scattered deposits on uneven grades. The principal development of belt conveyors underground has been in coal mines but this form of transport is gaining in other mines.

Belt haulage is used in the main slope and shuttle cars in the stopes at the White Pine Copper Company's mine in Michigan. Had this mine been developed 10 years earlier, rail haulage probably would have been used in drifts in the deposit and skip haulage in the main incline; under such conditions, the cost per ton of ore now being mined would have been appreciably higher than with the present set-up. The shuttle cars discharge into coarse crushers above the incline and the crushed ore is fed on to the main haulage belt which in turn discharges into the the mill bins on the surface.

The introduction of continuous coal mining machines introduced an urgent transportation problem of removing the coal as fast as the mining machines produced it. Shuttle cars presently are largely used for this purpose but there is delay while one car pulls away and another takes its place at the tail end of the mining machine. Belt conveyors are also largely used in conjunction with the shuttle cars. An improved extensible belt conveyor using rope belts came out during the year. It takes the continuous load directly from the miner and advances by extending itself as the miner proceeds forward. A bridge is mounted on the mining machine. The conveyor unit can extend to 1,000 feet and said to handle in excess of 1,250 tons of coal in eight hours.

New types of belt conveyors are now being pioneered in Europe. Substantial lower first cost as well as lower operating costs per ton are to be expected. These new conveyor systems also promise greater flexibility. There should be applications for these new developments in United States mines.

ROOF SUPPORT: The use of yieldable steel sets for support in moving ground increased during the year.

Progress in the art of roof bolting was was made in metal mines during the year. Climax Molybdenum uses rock bolts and chain-link mesh for support in temporary slusher drifts. Old ¾ mesh screens are used with rock bolts as a similar application at an iron ore mine in New Jersey. The base of the legs of steel sets in a 9-by 9-foot heading are secured by rock bolting at the mine of the Zinc Corporation, Ltd. in Australia.

SMALL URANIUM mines use tractors and rubber-tired trailers for ore haulage.

CHAIN LINK FENCE held in place with rock bolts grows in use before concreting.

ROAD MAINTENANCE UNDERGROUND cuts costs and adds to life of haulage units.

Although rock bolting was a United States development, the practice has been widely adapted in other countries. Sweden appears now to be taking a leading part in research for improving the application of the bolts, of grouting of bolts in the holes, and of new designs of bolts. Results are promising. Similar experiments with new types of bolts used in conjunction with grouting is also being carried on in this country. The Bakelite Division of the Union Carbide and Car-

bon Company in cooperation with the U.S. Bureau of Mines is experimenting with a resin named Epoxy which has a controlled rate of setting for cementing rock bolts in place. Work is also being done with Epoxy as a grout for consolidating strata. Another series of experiments is in progress with fiber glass rock bolts which cost one-third less than steel with a comparable strength.

The U. S. Bureau of Mines is conducting research regarding the relation of the rock-bolt load to roof sag as a part of a program for determining the stability of mine roofs.

Research is being done with rock bolts up to 50 feet long in large chambers for stabilizing the formation, both in the United States and Sweden.

A number of mining companies have research departments that are conducting experiments in the application of rock bolts and in improving rock bolting practices. Mining companies also are conducting research to improve other mining practices.

HANDLING SUPPLIES: Handling supplies into a mine always has been a bothersome chore and frequently interferes with production. During recent years the trend has been to handle supplies with mechanical devices and also to package such supplies for fast transit.

A Canadian manufacturer is now marketing a timber car that can be trammed to the shaft collar, slung below the cage, lowered down the shaft, removed from the shaft, and then trammed to the required working place. Materials up to 16 feet long can be handled and, with the sides enclosed with expanded metal, the car can be used for removing trash.

SUMMARY: In general, manufacturers introduced new models of machines used in mining that promises lower mining costs. Improvements also were made in current models to increase efficiency. Refinements in mining practices and procedures were wide-spread. The use of mixed explosives is reducing blasting costs at some open-pit mines.

PROGRESS THROUGH BETTER TECHNOLOGY

Blue Ribbon Equipment Awards for 1957

UNDERGROUND

SHUTTLE CAR

Joy Manufacturing Co.'s new 14-RC unit hauls up to 15-ton loads and is reported capable of operation up steep, adverse grades.

Circle No. 16 on the inquiry card.

SHOCK ABSORBING HANDLE

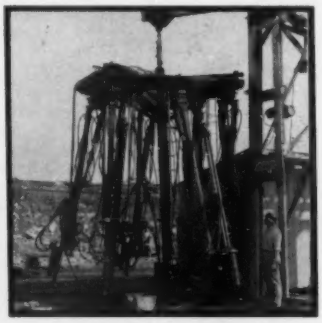
New handle for Cleveland sinkers, made by LeRoi Division, Westinghouse Air Brake Co., eliminates drill vibration for operators.

Circle No. 17 on the inquiry card.

ROPE BELT CONVEYOR

Wire rope supported idler assemblies offer low installation costs, from Goodman Mfg. Co.; also used in extensible conveyors.

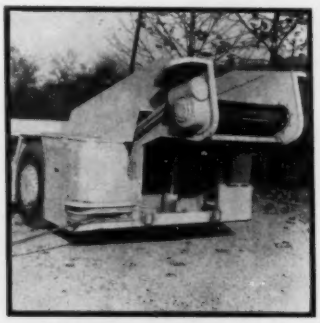
Circle No. 18 on the inquiry card.



SHAFT JUMBO

Hydra-Boom jumbo, made by Ingersoll-Rand Co., is lowered and raised as a unit reducing labor and set-up time over hand methods.

Circle No. 19 on the inquiry card.



NEW SHUTTLE CAR

Powered by a single A.C. or D.C. motor, new "TorKar" unit of National Mine Service Co. is said to offer maintenance savings.

Circle No. 20 on the inquiry card.

INCLINED SHAFT MUCKER

Shaft & Development Machine Co.'s re-designed Cryderman mucker with telescopic boom and clam bucket for inclined shafts.

Circle No. 21 on the inquiry card.

RIP Recovers U_3O_8; Carbonate Leach For Ambrosia; Solvent Extraction Grows

By H. L. HAZEN
H. L. Hazen, Inc.
Denver, Colorado

During 1956 the uranium milling industry took some giant strides in developing new processes, improvements of old ones, and developing new equipment.

Among the most important changes in metallurgical processing, have been the firm establishment of the resin-in-pulp (RIP) method and the successful full scale application of solvent extraction.

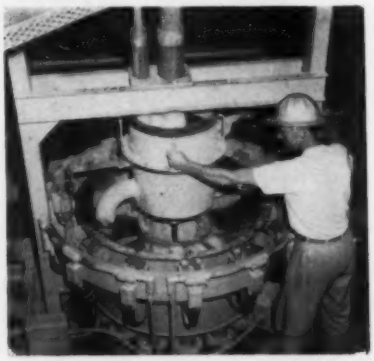
RESIN-IN-PULP: By the end of 1956, five mills in the United States were processing uranium ore by the resin-in-pulp method at a total combined rate of approximately 4,900 tons of ore per day. By the end of the year, these mills were producing more than half of the uranium concentrate in this country making 1956 the big year for RIP.

The RIP process recovers dissolved uranium from acid slime pulp by adsorption on anion exchange resin beads. The operation has been described in detail in literature appearing during the past year. Briefly, in this process the resin beads are contained in acid proof baskets that oscillate up and down in a trough through which acid leached slime pulp flows. The resin beads are retained in the baskets by the screen but still have sufficient contact with the pulp to adsorb the dissolved uranium.

The five mills which use RIP and the Atomic Energy Commission pilot plant at Grand Junction, Colorado, are continually improving the RIP processing and equipment.

The RIP plant operated by National Lead Company for the AEC at Monticello and the mill built by Uranium Reduction Company at Moab, Utah, use 6-foot screen baskets to hold the anion exchange beads. The larger baskets make for cheaper RIP equipment when handling larger tonnages. The other RIP mills use screen baskets that are either 4 feet or 4½ feet in cross section, for the resin.

Most of the RIP mills direct the flow of slurry and eluting solution through valve connections that let the operators send either slurry or eluting solution to any bank, to tailing, or to pregnant storage. A leaky valve in this system could drip pregnant eluate solution into the tailing without anyone's knowledge. The Edgemont, South Dakota mill of Mines Development Inc. put in a system that uses no valves although, as at all the other plants, any slurry or eluate can be sent anywhere. The chief advantage of the Edgemont system is elimination of unknown leaks.



PULP DISTRIBUTOR uses no valves to channel pregnant eluate without loss.

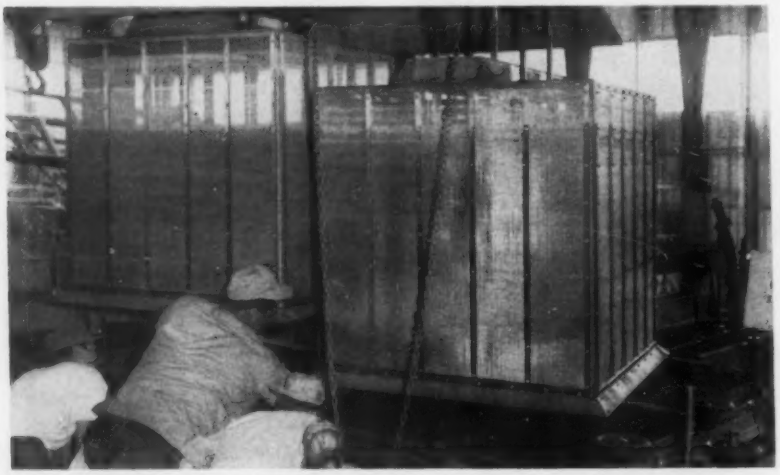
Different types of equipment are being investigated for RIP. The newer RIP machines being tested, move the resin beads counter-current to the flow of ore slime pulp. The advantage of the new types, if successful, would be lower equipment cost and possibly greater efficiency due to better contact and real counter-current flow of the beads and the slime slurry. The question not yet resolved is the loss of resin beads by attrition in the new equipment.

Since the establishment of the RIP system, several modifications have been made by operating plants which result in improved economy. One of these improvements is concerned with elution of the adsorbed uranium from the resin. In the normal system ammonium nitrate solution is used for this step. A new procedure was developed by the AEC pilot plant at Grand Junction. Instead of eluting the nitrate the beads are eluted with 10 percent sulfuric acid solution. Uranium is recovered from this acid solution by solvent extraction. The solvent used in the tests was di-2-ethylhexyl phosphoric acid and tri-butyl phosphate dissolved in kerosene. After extraction of the uranium the remaining strong acid was either returned to the ore leaching circuit to treat fresh ore or was recycled for further eluting of resin. The uranium in the pregnant organic solvent was stripped with a 10 percent soda ash solution and precipitated in the standard manner. This method is called "Eluex" and appears to be an attractive development although it has not been installed in any operating mills yet.

Another change in elution was required by sulfate trouble in the uranium concentrate. In the standard ammonium nitrate elution and subsequent precipitation of yellow cake, it has been found that under some conditions an insoluble ammonium-uranium-sulfate precipitates also. The AEC recently raised the permissible sulfate content of yellow cake to 15 percent of the contained U_3O_8. This change in specifications permits the RIP plants, using ammonium nitrate elution, to produce a product that can be sold to the AEC without penalty. However, at the Edgemont mill the sulfate problem was overcome by elimination of ammonia from the circuit completely and using acidified sodium nitrate for elution. The concentrate currently being produced by this method meets AEC specifications.

The largest of all the RIP plants, the one operated by the Anaconda Company at Bluewater, New Mexico, has led the wave in decreasing precipitation costs from RIP pregnant eluate solutions. At that plant they first use lime to raise the pH of the solution to 2.5 or even as high as 3.5. This does not precipitate uranium but does remove from solution any ferric iron, vanadium, or aluminum that may have been adsorbed and eluated from the resin. It also reduces the amount of NH_4 or MgO needed to raise the pH to 6.8 and precipitate yellow uranium di-uranate from the solution after clarification.

In addition to the improvement in RIP recovery of uranium, considerable study has been made toward upgrading of lean ores prior to mill treatment.



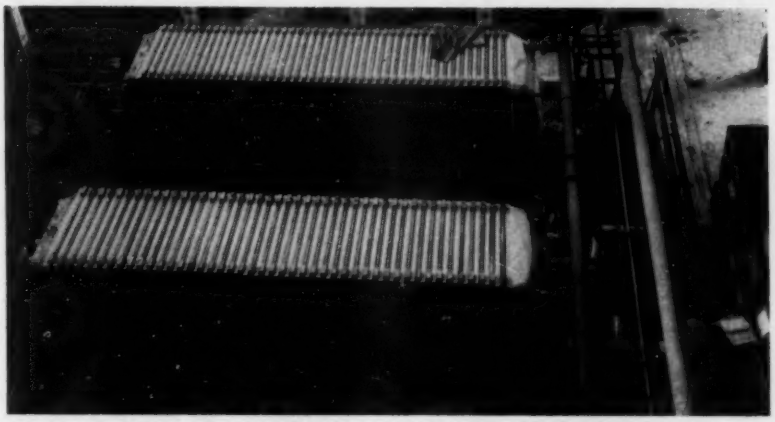
STAINLESS STEEL BASKETS hold the anion exchange resin beads in the Resin-In-Pulp process. These baskets are oscillated through a pregnant uranium slime pulp.

UPGRADING: Under existing AEC regulation, upgrading is not apt to be profitable except in unique circumstances. The AEC pays the miner 6¢ a wet ton

mile to haul ore to a uranium mill (up to 100 miles); it pays the miner for 100 percent of all the uranium in the ore at "Circular 5" prices (if it assays at least 0.1 percent U_3O_8) and for 100 percent of all the vanadium in the ore at 31¢ per pound; the AEC picks up the tab for the milling cost; because of all this it takes special conditions for a uranium upgrading plant to operate profitably at this time. After 1962 all this will change. Then the AEC will pay $8.00 per pound (up to 1,000,000 pounds per year) for U_3O_8 in specification grade concentrate. At that time upgrading plants may be profitable at many mines.

Reports tell of upgrading plants to be built by Union Carbide Nuclear Corporation at Slick Rock, Colorado and at Green River, Utah. But these plants will not be upgrading plants in the sense that upgrading is used by most mining people because at these plants the sand, after removal of slime in classifiers, will be leached with acid. The uranium bearing acid solution from the sand leaching will then be precipitated and the slime and precipitate shipped to a new plant at Rifle for final treatment. This concentrating method is similar to the first part of the flow sheet used by the Climax Uranium Company in its Grand Junction, Colorado mill. It is not the type of a relatively cheap upgrading plant that could be considered for use generally.

The capacity of the upgrading plant operated by the Vanadium Corporation of America at Monument No. 2 mine in Arizona, was greatly increased. The ore is ground wet and the slime separated from the sand in classifiers. The uranium concentrates is the slime which is filtered and dried in rotary kilns and then shipped to Durango, Colorado for uranium recovery. This upgrading process treats overburden that was formerly discarded and gives a product containing about 2.0 percent V_2O_5 and 0.25 percent U_3O_8. During 1956 this V.C.A. upgrading plant in Arizona was the only one that operated continuously and profitably.



FILTER PRESSES remove precipitated gypsum, ferric iron, and other impurities which were adsorbed and eluted from resin. Also used for filtering uranium precipitate.

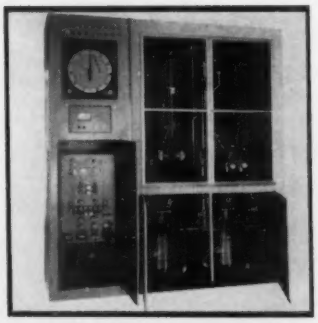
SOLVENT EXTRACTION: In 1956 the solvent extraction process was moved out of the laboratory pilot plant phase and turned into a commercial reality.

Solvent extraction is a new tool that has been given mill men by different research laboratories. Carbide and Carbon Chemical Company operates the Oak Ridge, Tennessee National Laboratory under contract with the AEC and has tested different organics for their value in solvent extraction. That laboratory has done most of the reported laboratory work with di-2-ethylhexyl phosphoric acid and with amines. The Dow Chemi-

PROGRESS THROUGH BETTER TECHNOLOGY

Blue Ribbon Equipment Awards for 1957

CONTROL & LABORATORY EQUIPMENT



AUTOMATIC TITRATOR

Industrial Physics & Electronic Supply make this device to control lime feed in flotation circuits at $_pH$ level of 7.

Circle No. 22 on the inquiry card.

LABORATORY DRYER

A new sample dryer by Hack Engineering Co. eliminates fuel contamination, has automatic temperature control, easy to clean.

Circle No. 23 on the inquiry card.

POCKET $_pH$ METER

Readable to 0.1 $_pH$, the Beckman pocket size battery operated $_pH$ meter has a unique combination electrode. For lab and field use.

Circle No. 24 on the inquiry card.

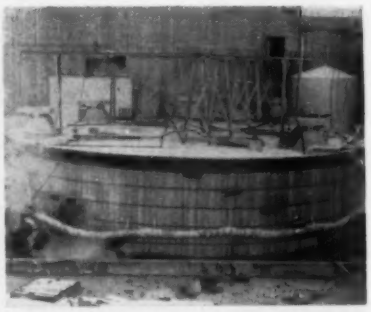
cal Company, at Pittsburgh, California, is responsible for most of the work with dodecyl phosphoric acid. Not only the uranium industry but all branches of metallurgy are greatly indebted to these laboratories for developing solvent extraction to the point where it can be used in hydro-metallurgical plants. The AEC has paid for this work.

Commercial application so far has been limited to treating clear solutions. The industry, to date, has favored di-2-ethylhexyl phosphoric acid as the active agent for solvent extraction of uranium from acid solutions. Literally hundreds of other organics have been tested in laboratories and two of these different organics will shortly be used on a large scale. The new plant being built at Mexican Hat, Utah by Texas Zinc Minerals Company, will use amine 9D-178 made by Rohm and Haas Company. This amine acts as a liquid anion exchange agent in contrast to the organo-phosphoric acids which act as cation exchange agents. The great advantage of amines is that they do not readily extract ferric acid from solution. Organo-phosphoric acids have such a high affinity for ferric iron that the iron must be reduced to the ferrous state before being sent to the solvent extraction circuit.

Vitro Uranium Company, at its Salt Lake City, Utah plant, will use dodecyl phosphoric acid in its new solvent extraction unit. This organic has a greater adsorption coefficient for uranium than enjoyed by di-2-ethylhexyl phosphoric acid. Since the dodecyl phosphoric acid is soluble in soda ash solution the uranium will be stripped from the pregnant organic with 10 M hydrochloride acid which will be recovered by volatilization and recycled.

Two solvent extraction plants were in operation by the end of the year 1956. These were the Kerr McGee Oil Industries, Inc.'s mill at Shiprock, New Mexico and the Climax Uranium Company's mill at Grand Junction, Colorado. At Shiprock, recovery of uranium from acid solution has been better than 99.7 percent with a chemical consumption in the solvent extraction circuit as follows:

Iron for reduction	0.75	pounds per pound of U_3O_8
Sodium carbonate	2.0	pounds per pound of U_3O_8
Solvent loss	0.5	gallons per 1,000 gallons of aqueous treated



SOLVENT EXTRACTION equipment for the recovery of vanadium at Ship Rock.

Sulfuric acid to destroy carbonate	1.6	pounds per pound of U_3O_8
Ammonia for precipitation	0.15	pounds per pound of U_3O_8

This solvent extraction unit operates without trouble and with little attention.

Climax Uranuim Company at its Grand Junction Plant, replaced phosphate precipitation in favor of solvent extraction using di-2-ethylhexyl phosphoric acid, and tri-butyl phosphate mixed with kerosene. This solvent extraction circuit is very successful and operates with little attention.

At both the above mills mixer-settler units have been used for both extraction and stripping steps of the process. However, the new plant of the Texas Zinc Minerals Company at Mexican Hat, Utah is planning to use a Podbielniak centrifugal extractor in its amine 9D-178 extraction process.

The Gunnison Mining Company will use mixer-settler units for the solvent extraction circuit in the mill being built at Gunnison, Colorado. That mill will start with di-2-ethylhexyl phosphoric acid as the extracting organic. With very slight changes in the stripping circuit, this organic will recover thorium and molybdenum if and when those metals appear in solution in commercial quantities.

Laboratory work has been completed for recovery of vanadium, molybdenum, thorium, the rare earths, and other metals from acid solution by solvent extraction. Already, Kerr-McGee Oil Industries, Inc., at Shiprock, has put in solvent extraction equipment to recover vanadium that is dissolved when uranium is extracted from ore treated.

It should be mentioned in discussions of solvent extraction and its comparison to ion exchange, that the solvent extraction appears to be inherently easier to operate. It should not be used on very low grade solution because of loss of organic. This loss amounts to about one-half gallon of organic mixture for each 1,000 gallons of liquor treated regardless of the liquor grade. Resins on the other hand can recover from very low grade solutions without any large increase in direct costs per pound of metal recovered.

Up to this time no method has been developed to recover uranium from a ground ore slurry by solvent extraction without excessive loss of organic. Many pilot plant runs have been made to check the value of solvent extraction for recovery of uranium from acid pulps. The U. S. Bureau of Mines at Salt Lake City joined with the Dow Chemical Company in a rather extended and persistant effort to extract uranium from ore slurries by solvent extraction. The group at Oak Ridge tested uranium recovery from ore slurries by solvent extraction. At both places the tests were almost successful, but not quite. The troubles at both plants were due to emulsions formed between the ore slime and the organic. It seems reasonable to believe that in time this emulsion problem will be solved and when that happens the research laboratories will have greatly extended the value of solvent extraction. Until this matter of emulsion is worked out, RIP will continue to have an important place in the treatment of some ores.

The trend for uranium mills during the coming year seems to be going in all directions at once.

The first mill built to treat ores from the Ambrosia Lake, New Mexico deposit will leach with soda ash solution. This mill is being built by the Homestake, New Mexico partners.

Uranium Reduction Company at Moab, Utah will probably change one of its circuits from acid RIP to alkaline RIP. Ore with the highest lime content will be leached with soda ash solution and the uranium recovered in the alkaline RIP circuit.

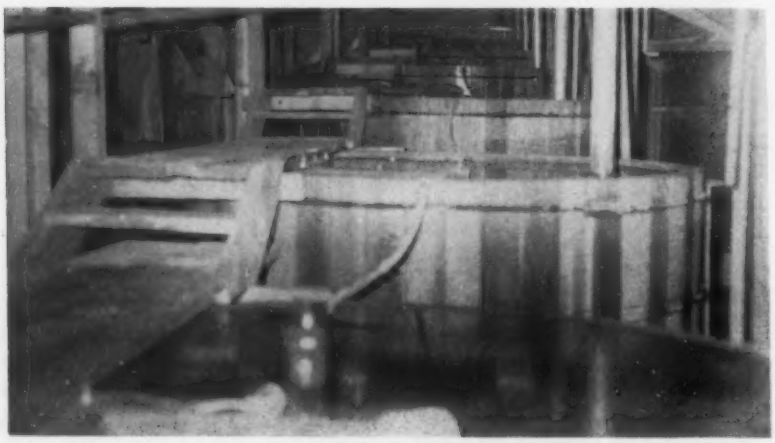
The Lucky Mc Uranium Corporation's mill in Wyoming intends to recover uranium from solution by ion-exchange in columns.

Lost Creek Oil and Uranium Company in Wyoming is erecting a mill to acid leach its ore and recover uranium by RIP.

The plant that Atomic Fuel Extraction Company hopes to build at Bedrock, Colorado will extract both uranium and vanadium by a counter-current hot acid leach. The uranium and the vanadium will be recovered in separate solvent extraction circuits.

RECOVERY FROM LIGNITE: The lignite industry in the Dakotas hopes it will have construction started on a uranium mill in 1957. The best method the AEC laboratories have found to recover uranium from lignites is to burn the lignite at 500° C; leach the ash with acid; wash counter-current with filters; and recover uranium and any dissolved molybdenum by solvent extraction.

In summary the year 1956 has seen some transition of new techniques and it is probable that this process will be continued at an accelerated pace in 1957.



MIXER-SETTLER tanks have been used for both extraction and stripping steps in the solvent extraction process. Results at two Colorado Plateau mills are excellent.

New Iron Mills Use Flotation; Research For Reduction Roasting To Magnetite

By STEPHEN E. ERICKSON

Metallurgist
M. A. Hanna Company
Hibbing, Minnesota

At the present time Iron Ore Beneficiation is in a state of vast transition. The technology is changing from that of the simple washing plant to more complex beneficiation plants in the entire mining industry. This trend started about 15 years ago and has been greatly accelerated since about 1950. The big interest at present is in the new taconite concentrators.

MAGNETIC TACONITE: In 1956 the magnetic taconite concentrator of Reserve Mining Company went into full-scale commercial operation. The full-sized plant of the Erie Mining Company is scheduled to start in late 1957. Both plants are in Minnesota.

The Reserve plant has a capacity for producing 3,750,000 long tons of concentrate pellets per year. The rated capacity is 36,000 long tons of crude ore feed per day.

The Erie plant has a capacity for producing 7,500,000 long tons of concentrate pellets per year. Its rated crude ore feed rate is 63,000 long tons per day.

Other magnetic taconite concentrators are The Hilton Mines with a capacity of 600,000 tons of concentrate per year which is under construction in Quebec; the Marmora mine of the Marmoraton Company with a capacity of 500,000 tons of concentrate per year, located in Ontario; and United States Steel Corporation's Pilotac concentrator in Minnesota with a rated capacity of 500,000 tons of concentrates per year.

In general the flow schemes of these plants are quite well standardized. The crude ore is drilled and blasted in the mine and loaded with power shovels. The mined ore is then dumped directly into a primary gyratory crusher. The primary crusher product is then crushed further in two stages of crushing with intermediate screening to remove fines. It should be specifically noted that closed circuit crushing is not used. The final crushed product, which is between 1 inch and ¼ inch in top size, depending on the plant, is then conveyed to the mill storage bins. To this point the process is dry. The ore from the mill storage bins is fed to rod mills which are in open circuit and nominally crush the ore to about 10 mesh. In some plants the rod mill product passes directly to a ball mill and in other plants the rod mill product goes to a magnetic separator, termed a cobber, which discards a tailing and makes a low-grade concentrate that goes to the ball mill. The ball mill discharge is fed to rougher magnetic separators which make a tailing that is discarded and a concentrate that is pumped to cyclones for classification. The cyclone underflow is returned to the ball mill and the overflow goes to finisher magnetic separators that make the final concentrate and a tailing that is discarded. At the Reserve plant, the cyclone overflow is sent to a hydroseparator from which the slime overflow is discarded and the underflow is pumped to the finisher magnetic separators.

The finished magnetic concentrate may be thickened in a hydroseparator or may be sent directly to disc type vacuum filters. The filtered concentrate is mixed with bentonite and then rolled into balls or pellets in a balling drum. The balls are then hardened by heat treating.

The magnetic concentrates produced are 60 to 85 percent minus-325-mesh. The finished pellets are sized between 1½ inches and about ¾ inches. The pellets will usually assay in the range of 62 to 65 percent iron.

At the Reserve operation the ore is crushed to minus-3-inch at the mine and it is then transported by railroad 47 miles to Lake Superior where the rest of the crushing, concentrating, and pelletizing is done.

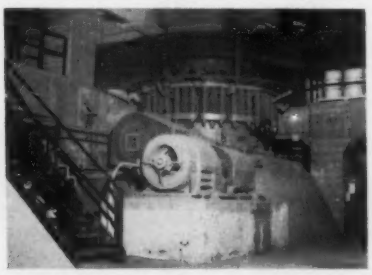
At Erie, on the other hand, all of the operations will be at the mine and only the finished pellets will be hauled by railroad to the loading docks on Lake Superior.

It is of particular interest to note that four of the five magnetic taconite concentrators listed use cyclones for classification in the grinding circuit rather than conventional classifiers. Reasons for this are that magnetized particles can be satisfactorily classified, they are more flexible, more adaptable to changes in tonnage or feed characteristics, require less water and less floor space, and have indications of less overall maintenance and power costs.

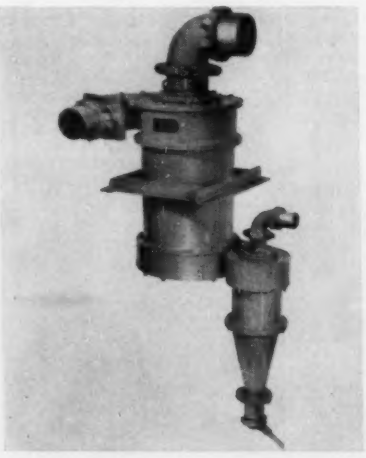
In general there appears to be a considerable preference for drum type magnetic separators with some tendency toward permanent magnet types. All finisher magnetic separators are of double drum construction with intermediate repulping of the concentrate from the first drum.

NON-MAGNETIC TACONITES: The reserves of non-magnetic taconite exceed the reserves of magnetic material by many times but to date only two plants are in operation on this class of ore. Both of these are in Michigan and are treating the jaspar ores which contain the iron largely in the form of specular hematite. These are the Republic and the Humboldt plants operated by Cleveland-Cliffs Iron Company. Both of these plants use the flotation process for the recovery of the iron minerals.

The Humboldt plant started operating in 1954. The flow scheme is as follows. The crude ore is loaded at the mine with 2½-yard electric shovels. It is dumped into a 48-inch primary gyratory crusher which reduces it to about 6 inches. The crushed ore goes into a surge hopper from which it is withdrawn by a feeder onto a conveyor. The conveyor discharges onto a double-deck vibrating screen. The plus-2-inch oversize is fed to a cone crusher. The minus-2-inch material from the screen and the crusher discharge join on a conveyor belt which conveys the material to a surge bin. It is fed from this bin to a conveyor and then to a double deck screen which makes a separation at ¾ inch. The oversize is fed to a short head cone crusher for the tertiary crushing stage. The crusher is set to produce a product of which 90 percent will be minus-¾-inch. The crusher prod-

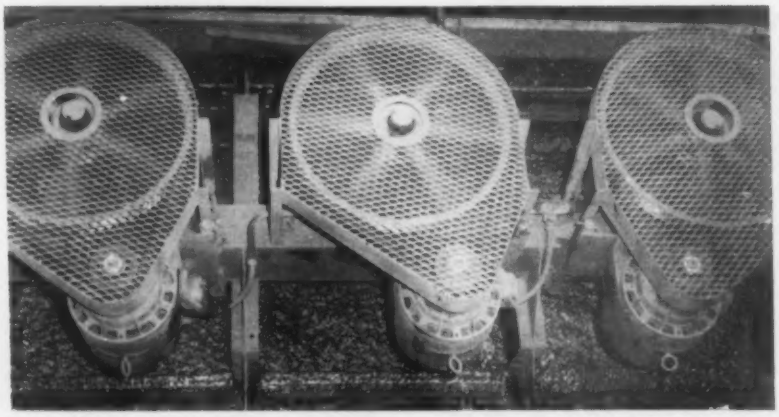


OPEN CIRCUIT CRUSHING is used exclusively in the magnetic taconite mills.



FOUR OUT OF FIVE magnetic taconite mills use cyclones for classification.

MAGNETIC SEPARATOR preference is the drum type with permanent magnets.



FLOTATION's greatest application is for concentration of the Michigan specular hematite ores. Cleveland-Cliffs Iron Company operates the only commercial mills.

uct and the screen undersize join on a conveyor belt which takes the material to an 1,800-ton capacity mill feed bin.

Four belt feeders withdraw the fine ore from the mill feed bin and send it to a conveyor which discharges into a 9- by 12-foot rod mill. The rod mill discharges into a 14-foot hydroscillator. The hydroscillator sands discharge into a ball mill. The ball mill product is circulated back to the hydroscillator. The hydroscillator overflow, which is minus-65-mesh, is pumped to a 24-inch cyclone. The overflow of the 24-inch cyclone is fed to a bank of 6-inch cyclones for desliming. The slime overflow of the 6-inch cyclones is discarded. The cyclone underflow goes to a spiral rake densifier for further thickening. The product from the densifier goes to conditioners where flotation reagents are added and thence to mechanical type flotation machines. The flotation machines make a final tailing and a finished concentrate which is pumped to a thickener; from there, the underflow is pumped to a drum type filter. The filtered product is sent to a separate agglomeration plant.

The capacity of the Humboldt mill is 70 long tons of crude ore feed per hour. This is equivalent to 250,000 long tons of concentrate per year.

The Republic plant has a capacity of about 3,500 long tons of crude ore feed per day. The rated yearly capacity is 550,000 tons. The crude ore averages about 39 percent iron. The concentrate produced assays 63 percent iron and 8 percent silica. The ratio of concentration is 2-to-1.

The flow scheme of the Republic plant is similar to the Humboldt concentrator except that it is arranged in two units, because of the increased feed capacity.

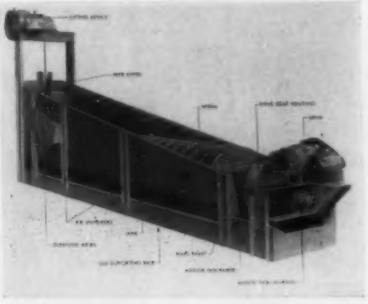
In Minnesota there are no plants treating the non-magnetic taconites. The Minnesota material does not contain specularite but instead contains more earthy types of hematite and other iron minerals. Therefore, in general, flotation methods have not proved encouraging in laboratory tests.

AGGLOMERATION: It was recently stated that 18 new sintering machines with annual capacity of 25,000,000 tons are scheduled for completion before the end of 1957. The estimated present sintering plant capacity is 38,000,000 tons. Thus it is seen that the subject of agglomeration and better preparation of the furnace charge has become one of major interest to the blast furnace men. In order to take advantage of this increased sinter capacity, most iron ore producers are being asked to separate the ores into coarse and fines. The coarse ore is charged directly to the furnaces. The fines are shipped separately and then sintered at the furnaces. As this subject is relatively new, the optimum size of separation has not been established as yet. Proposals are for sizing somewhere between ¾ and ⅞ inch, although the preferred size separation would appear to be around ½ inch.

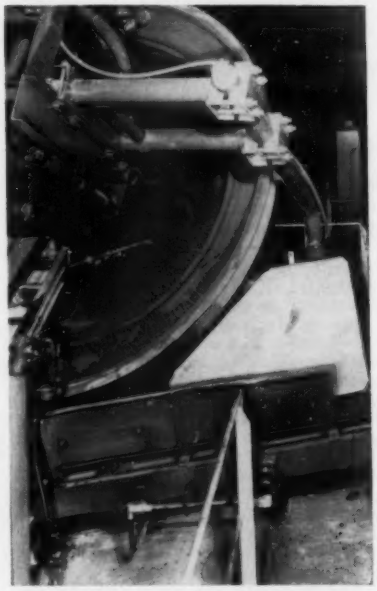
All of the taconite concentrates must be agglomerated before they can be used in the blast furnace and here we find a great variety of processes in use.

At the Reserve plant the filtered concentrate is conveyed to a series of 450-ton capacity storage bins. The concentrate is withdrawn from the bins by means of table feeders. The concentrates are conveyed to 9- by 30-foot concrete lined balling drums each with a capacity of 30 to 40 long tons per hour. Bentonite clay is added at the rate of 9 pounds per ton in order to increase the strength of the unburned pellets. The drums revolve at 10 to 11 revolutions per minute and roll the concentrate into pellets which are then screened on a vibrating screen. The minus-⅜-inch pellets are returned to the balling drum and the screen oversize goes to 8- by 12-foot coal-coating drums where 60 to 65 pounds of fine anthracite per ton of pellets are added. Each of these drums has a capacity of 30 to 40 tons per hour and rotates at 10.5 revolutions per minute. The coal coated pellets then go to 68-inch-wide by 168-foot-long traveling grate type pelletizing machines. Each of these machines, which are similar to sintering machines, has a capacity of about 100 tons per hour. Grate speed is about 60 inches per minute. Combustion is completed at a maximum temperature of 2,400° F. The first section of the machine is for updraft drying. This is followed by two down draft heating zones, an ignition zone, a burning zone, a heat recuperation zone, and two cooling zones. These zones are separated so that heat can be conserved and recycled. The finished pellets go over a bar grizzly from which pieces over 4-inch in size are fed to rolls for crushing. The pellets are then quenched and conveyed to the storage and loading areas.

The Erie, Marmora, and Hilton plants will be similar to the Reserve plant in the use of bentonite and balling drums.



LARGER MEDIA DENSIFIERS are used in Minnesota gravity concentration mills.



FLYING SAUCER used for pelletizing specular hematite flotation concentrate.

However, the end section of the balling drum will consist of a screen through which the minus-⅜-inch material is removed and returned to the head of the drum. Fine coal is also added but not in separate coal coating drums. The major difference between these plants and Reserve plant is in the subsequent heat treatment of the pellets. In these plants the pellets are fed into oil-fired vertical shaft type furnaces by means of oscillating belt conveyors. The furnaces are rectangular in cross section and the oscillating conveyors are designed to cover the area uniformly. In passing slowly through the furnace, the pellets are first dried and preheated, followed by baking at a maximum of about 2,400° F. in order to make them hard enough to withstand handling. The pellets are air cooled, screened to remove undersize material, and then conveyed to shipping bins.

In Michigan, the concentrate from the Republic plant is filtered and then transported by railroad to the pelletizing plant at Eagle Mills. At this plant the ore is

pelletized on a balling disc, locally called a "flying saucer". This device is an 18-foot-diameter disc mounted at an angle. It rotates at 7 revolutions per minute. The angle of the disc can be varied to control the pellet size.

The concentrate is reground to 65 percent minus-325-mesh and it is then thickened and filtered. Bentonite is added as a binder and pulverized limestone is added for pellet strength. This mixture is fed to the balling disc through a chute which drops it in the inside area of the disc. An outer concentric pocket around the rim of the disc receives coal for coating the pellets.

As the concentrate mixture drops into the center of the disc, it is carried down to an area where partly formed pellets are cascading and growing. When the mass is built up to pellets from ¾ to ⅝ inch in size they overflow into the outer ring where a coating of coal equal to about 5 percent of the pellet weight is picked up. The coated pellets overflow the bottom of the disc onto a conveyor belt which carries them to a sintering machine. Capacity of a balling disc is about 30 tons per hour. It is important to note that with a balling disc it is not necessary to screen the pellets to remove fines as this function is taken care of automatically by the operating adjustments.

The sintering machine is also quite different than that in use at the Reserve plant. The depth of bed is 36 inches and six layers of material are fired at once. First is a 4-inch layer of fired pellets, then a layer of ignition coal, then four separate 8-inch layers of green pellets from the balling disc. The grate travels 30 inches per minute. The machine is 6 feet wide and 224 feet long. The wind boxes cover 168 feet of length. Ignition is downdraft at the feed end with propane gas as the igniting agent. Firing is updraft, followed by updraft cooling, and then downdraft cooling. The gases from updraft cooling are returned to the firing zone. The temperature of the grate bars does not exceed 500° F. Bed temperatures may reach 2,400° F., however. The grate discharge is screened and

PROGRESS THROUGH BETTER TECHNOLOGY

Blue Ribbon Equipment Awards for 1957

GENERAL EQUIPMENT & SUPPLIES

GEAR REDUCER

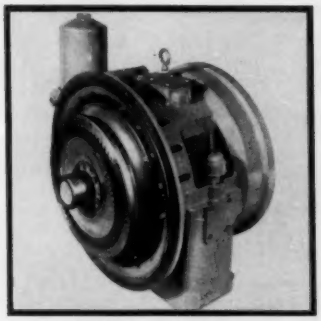
David Brown Industries, Inc., has developed a new gear reducer; teeth are shaved with profile of involute type for better efficiency.

Circle No. 25 on the inquiry card.

HIGH SPEED CONVEYOR

Hewitt Robbins Inc.'s new belt conveyor system travels at about twice the normal speed; accelerating belts cut feed-point wear.

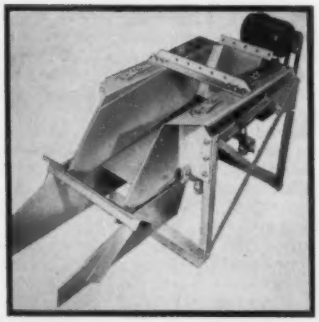
Circle No. 26 on the inquiry card.



TORQUE CONVERTER

Twin Disc Clutch Company's new single-stage torque converter offers 5 specific torque ratings; designed for 30 to 212 hp. engines.

Circle No. 27 on the inquiry card.



RECIPROCATING FEEDER

National Iron Company features a complete unit that mounts directly on a conveyor frame; cable-suspended plate eliminates track.

Circle No. 28 on the inquiry card.

INDUSTRIAL COUPLER

Lightweight aluminum couplers, elbows, tees and outlets for aluminum air and water lines are made by Industrial Coupler Co.

Circle No. 29 on the inquiry card.

INSULATED LINK

General Machine & Welding Works, Inc. offers a safety device for crane-boom contact with electric wires; link reduces danger.

Circle No. 30 on the inquiry card.

MAGNETIC TACONITE PELLETS roll out of this balling drum over a screen which separates the minus-⅜-inch material for recycling to the head of the drum.

minus-¼-inch material is returned to the ball mill. The oversize is stockpiled or loaded into cars for shipment.

At United States Steel's Extaca plant in Minnesota, the taconite concentrate can be pug-milled and then fed to a standard 6- by 96-foot sintering machine or it can be fed into an 11½- by 350-foot nodulizing kiln.

Which of these various methods for agglomerating the fine taconite concentrates will prove to be the most economical can not be determined as yet. Time alone will answer this question as there are obvious advantages and disadvantages to each system.

Washing: In the early washing plants, log washers were used to scrub and abrade the ore. These were expensive to maintain and operate and were gradually replaced by ordinary vibrating screens which did nearly as good a job of washing on the simpler, more easily treated wash ores. Then as the ores became more difficult to wash, scrubbing again came back into favor. First, the fines (minus-¼-inch) only were scrubbed in a process named abrasion milling. In this process, the ore was abraded or scuffed in a standard rod mill in which a very light charge of balls was used. The discharge of the mill was then rewashed in classifiers.

More recently a considerable number of "scrubbers" have been installed on the Mesabi Range for treating the coarse ore. These consist of cylindrical rod mill type vessels to which the coarse ore and water, only, are fed. In these the ore scrubs itself and no extraneous grinding media is necessary.

GRAVITY CONCENTRATION: Heavy media separation has been substantially unchanged for several years. There is a growing tendency to add more magnetic separator capacity so that more media can be cleaned in order to control viscosity when necessary. Larger media densifiers are also being used as they permit faster plant start-up after a shut down period and because a larger densifier assists in closer control of the media gravity.

There is considerable interest in the use of German atomized ferro-silicon because it would permit higher operating gravities or less sensitivity to slime contamination. However, this type of material has not yet been tested in any commercial plant in Minnesota. (United States Patent No. 2,774,734 covering the use of this material was issued on December 18, 1956.

A number of new cyclone plants are proposed for iron ore treatment. The major test work in connection with the cyclone plants is on the use of fine mesh screens for drainage and washing of the magnetite media. The trend in flow scheme thinking is to make the cyclone plant flow scheme more nearly like the standard heavy media flow scheme.

For the recovery of fine ore, the spiral alone or the spiral in combination with hydrosizers is still the preferred process. A number of other recently proposed fine ore recovery processes have been tested but none of them has proven to be as good. However, there is still an active search for a process that will prove to be more efficient than the spiral. It is well known that a spiral does not efficiently concentrate iron ore in as broad a band of screen sizes as would be desirable.

Jigs still find favor especially among the smaller operators and on the relatively small ore bodies. Largely, jigs are operated on ores in the same size range as that on which cyclones are used.

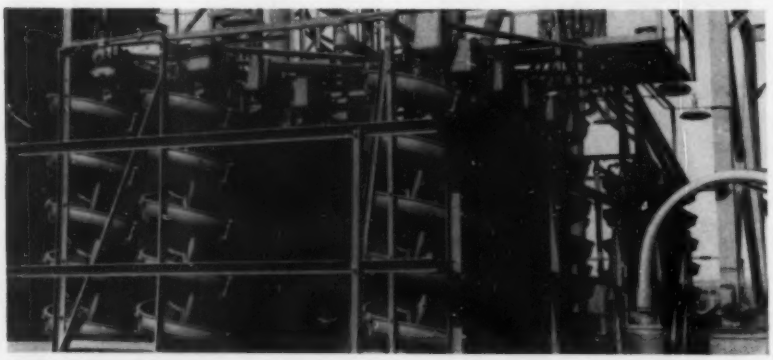
An interesting development will be the Jones and Laughlin Steel Corporation's new Hill Annex plant for retreating a fine wash ore tailing pond which is scheduled to go into operation in 1957. The tailing pond material will be mined by a dredge and the iron minerals will be recovered by a combination of spirals and flotation.

ACCESSORY APPARATUS: In one of the plants on the Mesabi Range the cyclone feed pumps are driven through a fluid coupling. This permits easy speed adjustment to compensate for pump wear or pulp variations so that cyclone pressure can be maintained at an optimum level. The fluid drive is controlled manually but this could be readily adapted to automatic control.

At another plant where the fine tailings are pumped some distance to the settling pond, the pulp density varies considerably due to fluctuations in feed rate and characteristics. Two pumps are used in series at this plant. The first pump runs at a constant speed. The speed of the second pump is automatically controlled by means of level probes in the pump sump. This arrangement is quite an efficient user of power.

At this same plant the fresh water pumps are located nearly three miles away. These pumps are operated by radio signal from the plant. This arrangement saves both installation cost and manpower.

Continuous devices for measuring the specific gravity of the heavy media are still being tested and so far a completely satisfactory device has not been found. One plant has installed a radio active source type of device but it has not operated for a long enough time to assess its value. It is an expensive instrument, however, and this is a disadvantage.



FINE ORE is recovered by spirals at this Minnesota mill. Spirals alone, or in combination with hyrosizers, are still the preferred equipment for fine ore.

Reserve Mining has investigated and adopted a number of instruments for control of various phases of its taconite concentrator and this has stimulated an interest in instrumentation and automation among the other operators.

FUTURE TRENDS: The impact of high-grade foreign ores and the decrease in domestic reserves can be felt in the Lake Superior district. These have caused the interest in taconites where concentrate grade can be controlled in contrast to wash ores where the concentrate grade is dependent on the type of crude ore feed. The local description is that "iron ore concentration is now a manufacturing process."

In foreign areas as the high-grade ores are exhausted the history of beneficiation will probably follow much the same course as it did on the Mesabi Range. Washing will be adopted first, then heavy media processes, and then the more complex variations of the established gravity concentration processes.

On the Mesabi Range, the magnetic taconites represent a relatively small part of the reserves. The vast reserve is, instead, in the non-magnetic taconites. For several years it was hoped that flotation processes could be applied to these materials and thousands of tests have been conducted along these lines. As the difficulties and limitations of the wide-spread use of flotation have become apparent, the thinking has gradually swung toward the process of reduction roasting followed by magnetic concentration. At the present time most of the larger organizations are actively investigating various ramifications of the reduction roasting step. In this process, the iron oxides are all converted to magnetite which could then be recovered by the use of flow schemes similar to those presently used on magnetic taconites. Reduction roasting, of course, adds another and somewhat costly step to the recovery process.

The next few years will be ones of great activity in iron ore beneficiation. We can expect to see considrable strides made in the development of new and different beneficiation processes.

PROGRESS THROUGH BETTER TECHNOLOGY

Blue Ribbon Equipment Awards for 1957

EXPLORATION

ELECTRODETECTOR

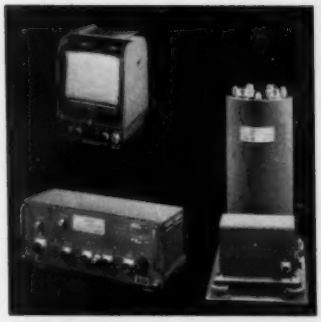
Aero Service Corp.'s helicopter contains an advanced electromagnetic detector, Gulf magnetometer and scintillation counter.

Circle No. 31 on the inquiry card.

CHROME PLATED BARRELS

Christensen Diamond Products Co. Chrome-Plated Inner Tubes of the Christensen Double Tube Core Barrel greatly increases tube life.

Circle No. 32 on the inquiry card.



PICK-AIR PROSPECTOR

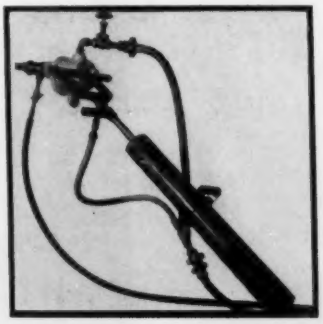
Pick Laboratories have developed a completely integrated airborne radiation prospecting system with instant altitude correction.

Circle No. 33 on the inquiry card.

MARINE SONOPROBE

Under the sea floor investigation of stratigraphy and structure is possible with Magnolia Petroleum Co.'s water-borne seismic system.

Circle No. 34 on the inquiry card.



AIR LEG CORE DRILL

E. J. Longyear Co. has developed an underground Air Leg Core Drill which can drill to a depth of 60 feet. Powered by air motor.

Circle No. 35 on the inquiry card.

ELECTROMAGNETOMETER

Aeromagnetic Surveys Ltd. have a helicopter borne electromagnetic detection system contained in a "bird" towed under a helicopter.

Circle No. 36 on the inquiry card.

Geologic Exploration Is A Group Effort Combining Information From Many Methods

By MANNING W. COX, partner Wisser & Cox, Consulting Geologists
55 New Montgomery Street
San Francisco, California

While in some segments of the mining industry exploration slowed down in 1956, viewed on a global basis, the year saw an even greater exploration effort than did the previous record year, 1955. Copper could be called the glamour metal of the year, but drilling and exploration companies report intense interest in uranium, iron, nickel—indeed in almost every metal, and most non-metallic materials. The year saw a growing recognition by large and small companies, and individuals, that with rapidly increasing world population and industrialization ANY natural resource of considerable magnitude is of commercial interest. From a North American viewpoint, perhaps the Canadian Shield received the greatest exploration attention, but from a global viewpoint it would be hard to single out one area; the greatest concentration of exploration effort has naturally been in those areas of least political risk, but the year saw the strong entry of Japanese and European venture capital into such places as Bolivia and Mexico. Serious exploration projects were underway in French Equatorial Africa, the Rhodesias, Australia, Brazil, the Philippines, in part by companies which had not previously operated in those areas. Within the United States, there appears to have been yet increasing recognition that very low grade deposits, due to advances in technology, offered interesting exploration targets, particularly in iron and copper.

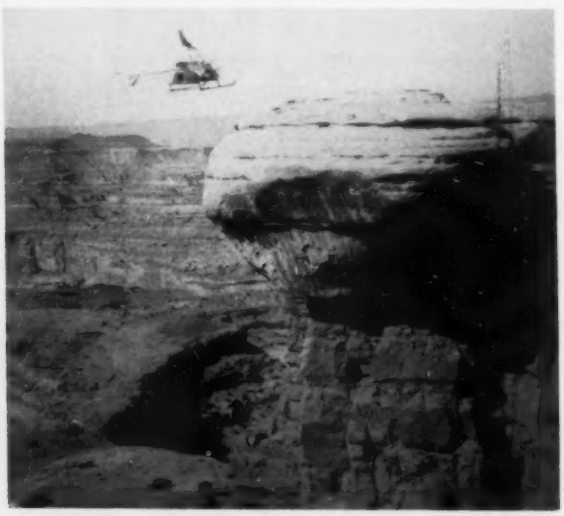
Along with such an extensive exploration effort has grown the recognition that exploration is not a one-science or one-man venture. It has become almost routine that a group effort is made in any exploration venture, combining the information and speed available from airborne mapping and geophysical methods with ground surveying, geophysical and geochemical methods, and the more prosaic drilling and underground exploratory work. An interesting development has been the wholesale basic exploration projects such as "Operation Tectonic" and "Operation Overthrust" directed by Photographic Surveys, Ltd. in the Canadian Shield areas of eastern Canada. Photogeologic methods as reconnaissance and follow up of field work become routine in mining exploration. It was announced during the year that 100 percent air coverage would soon be available for North Africa, Pakistan, Ceylon, Cuba, Alberta, Manitoba, and other tremendous acreages.

In western United States, the emphasis on long range exploration has been study of regional trends in the hope of locating new mining districts. United States Geological Survey work in Nevada has pointed up trends of mineral belts that are irrespective of the structural grain near the land surface. In the intensely prospected United States, such studies will be increasingly relied upon by major exploration agencies in the future.

As is to be expected, geophysical methods played an important role in 1956 exploration. Announcement of the development of an airborne gravity meter or gradiometer was made during the year. Several types of airborne electromagnetic methods have become widely used, both in fixed-wing and hovering aircraft. Substantial discoveries are attributed to this method, and one of the contracting companies in Canada claims nine discoveries made by this method in one small area in New Brunswick. Widespread application of combination airborne geophysical work such as gravity meter, plus magnetometer, plus electromagnetic methods, have indicated the necessity for extreme care in interpretation. It has been found, for example, in an intensely altered area of British Columbia, that the copper bearing alteration zones are indicated by pronounced magnetic lows. On the other hand, magnetite ores in eastern Canada have, in some areas been found to give anomalously low magnetic readings due to the shape of the deposits, or their local polarity in a direction markedly at variance with the earth's total magnetic field.

Ground geophysical methods in 1956 might be said to have greatly benefited by miniaturization. There is now available equipment consisting of plug-in components built largely with transistors, markedly cutting down weight and increasing maneuverability. During the year, the trend in geophysical ground methods seems to have been away from resistivity, self-potential and magnetic methods, to an increased use of seismic, gravity, and the newer electrical methods. Among these methods might be included overvoltage or induced polarization, pulse-transient and velocity logging methods developed by Newmont Mining Corporation and the United States Atomic Energy Commission and others. It is estimated that of the entire amount of geophysical work done in the world in 1956, perhaps 40 percent was done in Canada, 20 in the United States, 20 in Europe and the Mediterranean area, and the balance scattered throughout the world. High resolution reflection seismic

GROUND EM geophysical unit used in making a lead-zinc-copper survey in eastern Canada. Units have been miniaturized.



AIRBORNE PROSPECTING for uranium in the United States uses an increasing number of helicopters to reach isolated rims.

work in the Tri-State and Metaline areas of the United States by the Atomic Energy Commission appears to have had considerable use during the year.

Gravity meter surveys underground were used—no results have been indicated. Other geophysical methods in use during the year were measurement of thermal gradients in mineralized belts, measurement of remanent magnetism and paleomagnetism in iron formations, experimental use of a number of underground and bore hole logging methods, both electric and magnetic. During the year Houston Technical Laboratories announced the availability of analog and integrating type computers for use with ground geophysical methods. The outstanding thing about mining geophysica is, however, that the use of a combination of methods is now standard, and not too much reliance is given to geophysical anomalies indicated only by, say, magnetics or resistivity alone.

Geochemical prospecting was apparently quite widely used during the year. H. E. Hawkes reports on the result of a three-year campaign in New Brunswick, where stream sediment and water analyses were able to indicate some 43 anomalies, nine of which appear to definitely indicate mineralization, and four of which have been partially successfully drilled. Interesting developments in geochemical prospecting include: measurement of the abundance of complexing agents; base exchange capacity; the associated minor elements in soils and waters. The use of the spectograph for rapid soil surveys, to replace standard dithizone techniques, on the one hand, and the use of dithizone with ordinary gasoline and chemically pure simple reagents, on the other hand, are reported. Soil analysis has apparently become a standard prospecting method in many areas of residual and particularly lateritic soils. A byproduct of soil sampling for copper, etc., has been the use of this method to prospect for diamonds in Africa. There was a growing recognition that geochemical prospecting had severe limitations in dealing with transported soils; there was also the recognition that geochemical prospecting is, like geophysics, simply another and very essential member of the overall bag of tricks that every exploration man should have available.

Drilling technique continued to improve during the year. There was a greatly increased use of rotary rigs for hard rock exploration, particularly in the American Southwest. There came on the market all-purpose rigs which were able to drill by rotary, percussion, or coring methods, either wet or dry. A method for coring in loose formations by the circulation of a super-cooled liquid was described. One iron company found that percussion drill exploration with dry dust-catching and water injection was a most economical method of operation.

Although, to our knowledge, there were no significant new base metal discoveries in the United States, new discoveries and particularly major development continued in the uranium business. Towards the end of the year, it was possible for the first time to see potentially long lived major reserves in this new industry. The Ambrosia Lake district of New Mexico and the Gas Hills district of Wyoming, together with the Pryor Mountains, Montana; Monument Valley, Arizona; Slick Rock, Colorado, and the Great Sage Plain districts, appear to have

SEISMIC CAMERA has been an important factor in increased metal prospecting.

received the greatest amount of exploration attention. In Canada, significant discoveries were reported of asbestos in Newfoundland, of nickel and copper in the Ungava Trough, of complex base metal ores in New Brunswick, of copper and nickel in the Chisel Lake area of Manitoba, copper deposits in the Northwest Territories, and substantial proof of the major copper reserves in southern British Columbia. Development and discovery continued a pace in the now-famous Chibougamou district. A new bauxite field was announced in the Cape York Peninsula area of Queensland, Australia. While not a discovery in 1956, the first written report appeared on what seems to be a fabulous deposit of zinc silicate in the Vazante area of Brazil. Among the "strategic minerals" a first rank tungsten deposit in Montana and an important manganese find in Arizona may be cited of discovery by examination in old mining districts for newer metals.

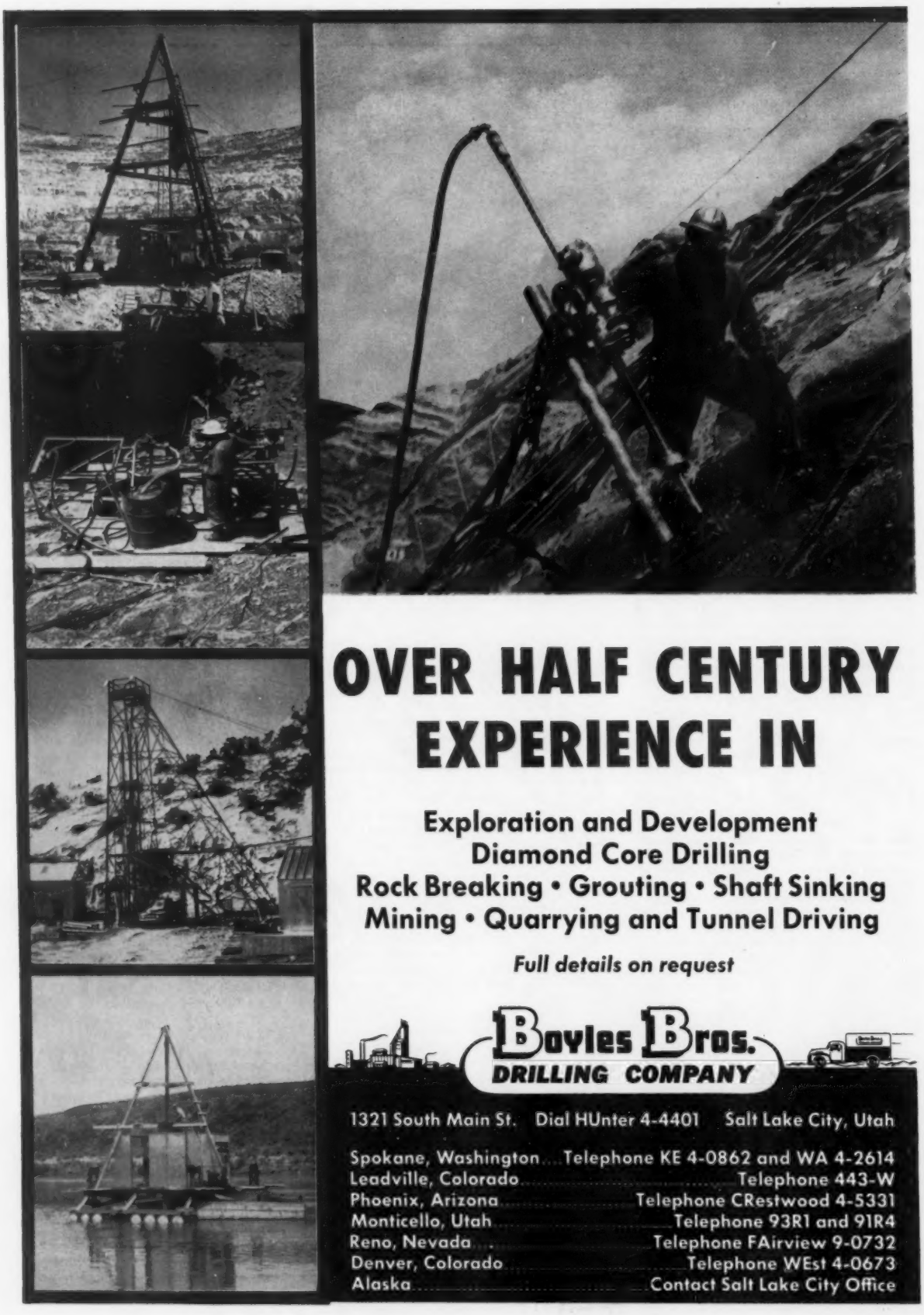
Aside from announced results, such as these, one gets the impression that 1956 might be characterized as a year of consolidation in the mining business, that is, continued development and detailed exploration of deposits in districts found in the previous few years. It might be called a year of stopping to catch one's breath.

The Boyd Committee of the National Science Foundation submitted a report in July of 1956 emphasizing again that discovery in the United States is NOT keeping pace with the consumption of raw materials, and therefore, the country is increasingly dependent upon foreign sources. It called to attention the estimate by George Fowler that our mineral wealth has come from less than 1,000 square miles of the land area of the United States, and makes the comment that it behooves us to find a second thousand square miles if we are to continue as an industrial nation. The Committee recommended the immediate foundation of a Minerals Research Center to attack the problem before it becomes more urgent. As a result of the committee's recommendations, a number of major mining companies are putting together a joint research effort. It takes such a report as this to dramatize the fact that little, if any, advance has been made in our basic knowledge of sulphide ores since the days of Lindgren and Emmens. As R. N. Hunt points out, "during the past 40 years mining geologists have learned to do their work skillfully by combining engineering skill with a considerable knowledge of economics in mining and metallurgy, and have thus become the examining engineers of mining companies and the planners of exploration. However, in doing so, they have been diverted from the basic problem of 'how, when and whence' in the genesis of ores."

The 20th International Geological Conference meeting in Mexico City made public in a flood of papers a mass of data which, as it is slowly absorbed by the working exploration fraternity, should result in better methods and new discoveries. Some 62 papers were prepared and presented in the symposium on geochemistry and geochemical prospecting under the able direction of Tom Lovering. During the year the first real summary of the occurrence of uranium was published as U.S.G.S. Professional Paper 300.

There appears to have been underway a great body of more or less pure research, which while perhaps not immediately applicable to problems of ore search, may well be the basis of our discoveries, at least in the United States in the immediate future. Studies, for example, of ZnS-FeS thermometry to indicate the cores of ore zones in the United States and Finland are reported. Isotope studies involving the stable components of the sulphur, hydrogen, oxygen and lead atoms appear to have considerable field application in the search for the deep-rooted feeders of such deposits as the Leadville, Colorado and southeast Missouri lead-zinc mantos. New methods for the determination of the probable absolute temperature and pressure of formation of minerals have been suggested; an example being the muscovite-paraganite relationships as taken in combination with the zinc-iron relationships in certain vein deposits. A detailed review reiterates the close association of the "rare metals" with alkalic igneous provinces and indicates a number of areas in the world where search for such metals is definitely warranted. Regional gravimetric studies are beginning to give us a better understanding of the distribution of basement rocks and possibly the localization of mining districts. Studies of the physical properties of rocks in a number of geophysical laboratories will give rise to better methods of measuring these properties and, hence, exploration methods applicable to mining problems.

And finally, what might be called a most interesting technological advance is illustrated by the papers published through 1956 on the close cooperation needed between the mining engineer, the geologist and the metallurgist. We have here, once again, an example of the integration of the skills and abilities of a number of different types of technicians focusing on the single problem of finding, developing, extracting, recovering, selling metals and minerals at a profit.



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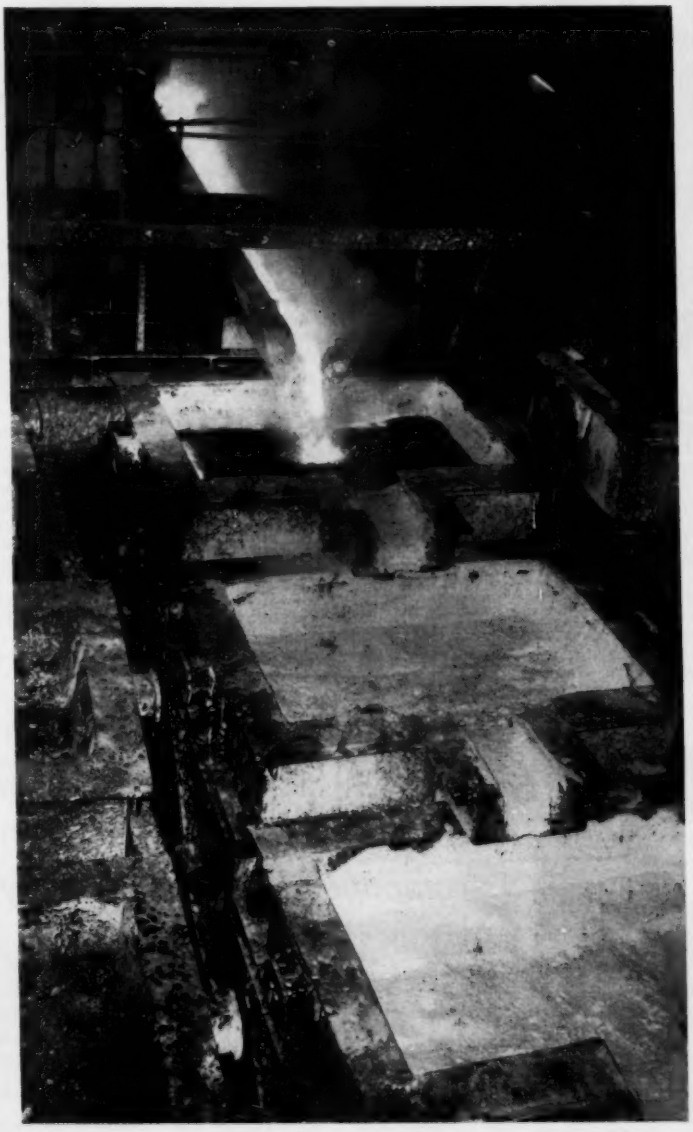


ALUMINUM

L. LITCHFIELD, JR.
General Manager, Mining Division, Aluminum Company of America, Pittsburgh, Pennsylvania

"Increasing quantities of bauxite will be supplied by Jamaica in the years ahead"

The year 1956 was a banner one for the aluminum industry. Production of primary metal reached a record high for the fifth successive year, and production of secondary metal was greater than 1955. Shipments of aluminum products were the highest ever, as the metal made great strides in old markets as well as new ones.

Primary production for 1956 totaled 1,679,247 tons—a 7 percent increase over 1955's 1,565,721 tons. The new production record was set even though strikes at eight smelting plants in August curtailed production.

Imports of primary aluminum during 1956 totaled approximately 230,000 tons, about 16 percent higher than last year's 198,000 tons. As in the past, the bulk of these imports came from Canada.

According to preliminary estimates by the Department of Commerce, recovery of secondary aluminum from all forms of scrap—new, old, and imported—totaled approximately 442,000 tons, up about 2 percent over the quantity estimated to have been recovered in 1955.

The aggregate supply resulting from this record primary production, larger imports, and greater recovery of secondary metal, was 2,350,000 tons of aluminum, an increase of more than 7 percent above total supply last year.

In 1956, the aluminum industry through its continuing program of expansion brought the metal supply up to the level of demand.

Actual shipments of aluminum products to consumers during 1956 were roughly 6 percent above 1955. The market distribution pattern for aluminum during 1956 was similar to that of 1955. The acceptance of aluminum in the building construction field keeps increasing. Substantial progress was made during the past year in the highway field.

Another large, growing market for aluminum is the transportation field, especially automobiles. Consumption of aluminum for 1957 per car is expected to be 38.1 pounds, up 10 percent over 1956.

Significant progress was made in the railroad and boating industries during 1956, and aluminum continues to make rapid strides in the electrical field. Packaging is a big expanding field. During 1956 aluminum rigid foil containers and flexible wrapping material appeared in large volume on grocers' shelves. These are, of course, only a few of the applications in which aluminum made significant progress during 1956.

Proof of the industry's faith in the future is indicated by the expansion in production facilities that was programmed during 1956. At the beginning of the year, domestic primary aluminum smelting capacity totaled 1,609,200 tons per year. By the end of 1956, United States primary aluminum production capacity in 17 plants reached 1,775,500 tons—2½ times as much as when the Korean War started.

Considerably more expansion is also underway which will boost the nation's capacity by 777,000 tons during the next two years. Representing an increase of more than 40 percent, the new facilities being constructed, including four new plant locations, will bring the nation's total capacity to more than 2,500,000 tons.

The foregoing rapid growth of the aluminum industry has necessarily required a substantial expansion of bauxite mining and alumina production. While mining activity in Arkansas continues at a fairly even level, a growing proportion of the bauxite consumed in this country is accounted for by imports.

In 1956 74.2 percent of the total new supply of bauxite for consumption was imported. Bauxite imports are steadily increasing, and in 1956 surpassed the record year of 1954, when 5,283,888 long tons of ore entered the United States. Imports during the three quarters totaled 4,486,458 long tons, a new nine-month high.

Jamaica, which first shipped ore in 1952, supplanted Surinam in 1955 as the largest source of imported bauxite, and this trend is continuing. During the first nine months, 49 percent of the imported bauxite came from Jamaica, 46 percent from Surinam, and the remainder from British Guiana and French West Africa.

Increasing quantities of bauxite will be supplied by Jamaica in the years ahead. Kaiser Aluminum Company is doubling its mining activity on the island, and Reynolds Jamaica Mines Ltd. is installing additional facilities there so that bauxite output can be doubled when necessary.

Aluminia Jamaica Limited is planning to begin mining in a previously undeveloped sector of its Jamaican properties and has announced it will build a second alumina plant on the island.

This year two other Caribbean countries—Haiti and Dominican Republic—will become a source of bauxite for the United States. Reynolds is completing installations in Haiti and expects to be in complete operation there early in 1957. Aluminum Company of America is constructing facilities for mining in the Dominican Republic and will begin operations there in the last half of 1957.

Despite the greatly accelerated rate of aluminum production, reserves of bauxite in the Western Hemisphere appear to be ample to supply North American requirements for many years in the future. Prospecting is actively being carried on by the aluminum producers and by others, and new discoveries are constantly expanding previous estimates of known reserves.

Thus, with a continual expansion of production facilities and aggressive market penetration underway, aluminum looks forward to another banner year in 1957.

ANTIMONY

JAMES BRADLEY
Vice President, Bradley Mining Co., San Francisco, California

"World-wide research on antimony semi-conductor compounds indicates a very promising future"

United States mine production of antimony (mainly the byproduct output of the Sunshine Mining Company, Idaho) amounted to about 550 tons in 1956 or less than 5 percent of United States primary antimony consumption. The following table summarizes the supply-demand situation during the past two years:

Due to lack of tariff protection, domestic antimony mines (other than byproduct producers) have been unable to operate in competition with low-cost imports during recent years. The Bradley Mining Co. commenced the dismantling and sale of the production facilities at its Yellow Pine Mine, Stibnite, Idaho (formerly the leading domestic producer) in the summer of 1956.

During 1956, the United States government made stockpile purchases of foreign antimony (through barter transactions) as

United States Primary Antimony Production, Consumption, and Imports in Short Tons of Contained Antimony in 1955 and 1956

Item	*1955*	*1956*[1]
Mine production	630	550
Consumption	12,000	12,500
General imports	12,000	13,000

1. Estimated.

well as domestic antimony (Sunshine cathode metal refined to stockpile specifications at Stibnite, Idaho).

World-wide research on antimony semiconductor compounds (aluminum-antimony and indium-antimony) indicates a very promising future. Especially in the growing solid state physics field. There are large potential applications for the "antimonides" in rectifiers, amplifiers, infrared and photoelectric devices, thermoelectric refrigeration and heating, solar batteries, etc.

ASBESTOS

K. V. LINDELL
Vice President, Canadian Johns-Manville Co., Ltd. General Manager, Asbestos Fibre Division Johns-Manville Corporation New York, New York.

"Asbestos has become a much desired raw material for peacetime as well as for defense needs"

Preliminary figures for 1956 put world production of asbestos fiber at 1,700,000 tons, a new high. It is estimated that of this amount Canada produced 1,040,000 tons; Africa 276,000; United States 45,000; Western Europe, 42,000; Australia, 9,000; all other areas, with the exception of Russia, 48,000 tons. It is exceedingly difficult to obtain accurate figures on Russian production. The best estimate is 240,000 tons in 1956.

World production of asbestos for 1957 is estimated to reach 1,850,000 tons from the following areas: Canada, 1,100,000 tons; Africa, 299,000; United States, 50,000; Western Europe, 48,000; Australia, 14,000; and Russia, 240,000 (?) tons. The balance is from all other areas.

Canada continues as the largest producer, maintaining a ratio of from 60-65 percent of the world market. Although the Canadian asbestos industry did not set any new production records for 1956, it was the second highest in the history of the industry. The previous record was set in 1955 with a production of 1,100,000 tons. About 97 percent of Canadian fiber is exported. The United States is the largest consumer, using about 60 percent of Canada's exports.

Anticipating increased future demands to keep pace with the world's industrial expansion, the Canadian industry is now completing a $95,000,000 expansion and development program begun in 1950. In addition to this program, expansion of present facilities and the opening of new mines are now underway to meet demand in the years ahead. Two new companies in the Thetford-Black Lake area of Quebec are expected to complete development work and construction of mills and to start commercial production in 1958.

Canadian asbestos is now mined in Quebec, northern Ontario and British Columbia. Quebec is by far the largest producer. New sources of commercial deposits are constantly being sought. In 1956 two promising discoveries were made. They are located in Newfoundland and in northern British Columbia.

Because of its versatility there is a steadily growing demand for asbestos fiber. Research and production organizations in the industry have developed new and improved uses for asbestos fiber, particularly in the shorter grades. Moreover the quality of the fiber is constantly being improved to meet the exacting demands of manufacturers and to meet competition in world markets.

As a result of these factors, asbestos has become a much desired raw material both for peacetime industrial and home requirements as well as for defense needs. With the marvelous advances being made in technology, and especially in the field of nuclear energy, there is no doubt that further uses will be developed for asbestos.

The industry does not anticipate the development of a synthetic fiber to take the place of the natural products. After years of intensive research, Johns-Manville produced a microscopic synthetic crystal of asbestos in 175 laboratories. But, it has been unable to produce even a tiny thimbleful of it. The cost is too prohibitive.

It is estimated that the world demand for asbestos will amount to 2,100,000 tons in 1960 and 2,300,000 tons in 1965.

There seems to be little doubt that the Canadian asbestos industry will be able to meet the increasing demands in the years ahead. Canada is expected to increase production to 1,450,000 tons a year in 1960 and to 1,600,000 tons in 1965. The industry is in a sound position. It has the ore reserves, the financial resources, and the equipment. More important it has the talents and experience of more than 6,000 people who know how to mine and mill fiber.

BERYLLIUM

D. H. HERSHBERGER
Treasurer, Brush Beryllium Company, Cleveland, Ohio

"Beryllium is now being used in inertial guidance mechanisms for guided missiles and aircraft"

The beryllium industry continued to receive impetus in its growth, particularly by the increase in uses for the pure metal. In addition to the presently known applications in atomic energy, the interest in the use of pure metal for structural applications is steadily increasing due to its unique physical properties. Some of these are: very high stiffness or rigidity (modulus of elasticity is 40 per cent higher than that of steel); very low density; high dimensional stability; about the same coefficient of expansion as stainless steel; comparatively high heat conductivity; high heat capacity; high latent heat of fusion; high melting point (2,332° F. vs. 1,204° F. for magnesium and 1,220° F. for aluminum); excellent resistance to oxidation up to approximately 1,500° F.; and it is non-magnetic.

Beryllium is now being used in inertial guidance mechanisms for guided missiles and aircraft. It is under active investigation for use in structural applications, as well as instrument parts and special components requiring the above unique properties possessed by beryllium. A study of the Rand Corporation, Santa Monica, California, shows interesting potential applications for the metal in aircraft structures by virtue of its light weight, stiffness and other properties. However, additional research and development effort must be expended in this direction to fully exploit the inherent possibilities of this field.

The United States Atomic Energy Commission announced in August that it let two contracts for 500,000 pounds each of reactor grade beryllium metal in the form of vacuum cast billets over a period of five years. One went to the Beryllium Corporation, Reading, Pennsylvania, who has specialized in beryllium copper alloys, and the other to The Brush Beryllium Company, Cleveland, Ohio, who so far has supplied practically all of the pure metal requirements in the United States and many other countries.

Both companies also received five-year contracts for the supply of beryllium copper master alloy to be used in barter contracts with the Commodity Credit Corporation.

All of these substantial contracts required plant expansions of both companies so that the industry's capacity at the end of 1957 will attain 75 per cent of its present capacity.

In anticipation of these requirements, the industrial consumers of beryl ore increased their buying at the same time that Government stockpiling activity diminished so that the market remained fairly steady. The year 1956 set a new record for United States imports of beryl: 12,371 short tons compared to the previous high of 7,998 tons in 1953.

The total included transfers of some accumulations in Argentina, Brazil, and India which are not expected to be equalled in 1957. Belgian Congo joined the list of countries producing good supplies because Derby & Co. Ltd. encouraged beryl production among mining groups there which had been mining tungsten ore. They are expected to repeat in 1957 the performance of last year.

The consumption of beryl in the United States during the year was probably between 4,300 and 4,500 tons, a 10 to 12 percent increase over the 3,995 tons for 1955.

For 1957, the indications are that a maximum of 5,000 tons of beryl may be consumed and the imports may be expected to total as much as 7,000 tons.

United States Receipts of Beryl in Short Tons By Countries of Origin For 1951, 1952, 1953, 1954, 1955 and 1956

Country of Origin	1951	1952	1953	1954	1955	1956[1]
Afghanistan	0	0	0	11	0	0
Argentina	0	550	1,459	0	441	2,330
Belgian Congo	0	0	0	11	126	992
Brazil	1,094	2,590	2,614	1,828	1,735	2,607
British East Africa	48	18	22	22	84	264
British Somaliland	0	0	0	0	9	29
British West Africa	0	0	0	0	0	22
Morocco	23	118	23	0	0	26
Hong Kong	0	0	0	0	0	1
India	449	196	199	391	844	3,360
Republic of Korea	0	3	8	4	6	0
Madagascar	0	0	330	77	28	213
Mozambique	174	308	392	1,295	620	1,110
Nigeria	0	0	0	0	3	0
Pakistan	0	0	0	0	0	15
Portugal	98	105	332	338	283	242
Rhodesia and Nyasaland	691	931	1,296	957	861	559
Surinam	0	0	0	10	0	0
Sweden	0	0	0	5	C	0
Union of South Africa	1,722	1,156	1,323	865	994	602
United States of America	488	515	751	669	500	500
Totals	4,792[2]	6,493[3]	8,749	6,483	6,536	12,872

1. Preliminary. 2. Finland, 5. 3. Finland, 3.

BORON

Peter Colefax
President, American Potash and Chemical Corporation, Los Angeles, California

"More money than ever before is being spent to discover the secrets of boron chemistry"

In many ways 1956 was a year in which the boron industry found itself in the limelight. Two of the three leading producers expanded by mergers. One producer is developing an open-pit mine and building a new refinery. Production reached a record level, and the pace of research efforts was further quickened.

In July of 1956 the stockholders of Pacific Coast Borax Company and U. S. Potash Company agreed to merge. The successor company's name was changed to U. S. Borax and Chemical Company, and the Pacific Coast Borax Company Division was organized to handle borate mining and processing operations. In September, another merger took place when Stauffer Chemical Company acquired West End Chemical Company. Formerly, Stauffer had a substantial interest in West End Chemical and marketed all of its boron products.

These organizational expansions were paralleled by expansions in production capacity. American Potash & Chemical Corporation adopted process changes at its Trona-California plant which resulted in a 25 percent increase in borate capacity. Stauffer Chemical Company announced plans to increase boric acid and boron trichloride capacity. U. S. Borax and Chemical Company continued its $20,000,000 dollar expansion program at Boron, California, (the Kramer deposit). This program includes changing over from underground to open-pit mining, along with construction of a big new refinery for boron chemicals. Stripping operations for the open pit began early in 1956 and progressed on schedule through the year. The pit is expected to be ready for production during the second quarter of 1957. Refinery construction is proceeding simultaneously, and by mid-1957 the plant is expected to begin operation.

A new entry at Boron is The California Borate Company, which acquired the old Western Borax mine and the Little Placer property. The Little Placer deposit is thought to be part of the vast Kramer borax deposit which is the main source of U. S. Borax and Chemical Company's raw material. During 1956 California Borate reconditioned the Western Borax mine shaft and equipment and did some development work underground.

United States production of borates in 1956 was probably near the 1,000,000-ton mark and by 1957 should be well past that mark. The trend of borate production and consumption has been climbing about 8 percent per year for the last decade. About three quarters of 1956's production was consumed in the United States, and one quarter was exported. The United States is now supplying over 95 percent of the world's borates. The only borate mines known to be operating outside the United States are in Turkey. The Turkish mines supply pandermite (essentially a calcium borate) to certain European refineries. In the United States borate prices held firm through the year with slight increases becoming effective the first of 1957.

The research facilities of two boron producers were substantially increased in 1956. American Potash put an additional $200,000 into a 100 percent expansion of its Whittier, California, laboratory and also expanded its activities in this field at its three other research centers. U. S. Borax and Chemical Company is building a new $1,000,000 laboratory in Anaheim, California.

More money than ever before is being spent to discover the secrets of boron chemistry. Researchers are finding that boron chemicals have special properties which satisfy many of the stringent demands of today's most severe applications. For aircraft use, plastics are needed that will retain their flexibility over such extremes of temperature as minus 40° F to over 1,000° F. With the help of boron, such plastics may become available. Also in the high temperature materials field are the new refractory hard metals called borides which are proving out as jet engine turbine blades and nozzles. Persistent press reports indicate a strong interest on the development of boron compounds for high-energy fuels. New ways are being discovered for using the neutron absorbing power of boron for atomic reactor shielding. Last summer saw the first use of boron compounds in fighting forest fires. In addition to these new and potentially new uses, existing markets are continually expanding.

Increased research, new uses, and steady growth of established markets all point to a healthy borate industry.

United States Production, Exports, and Apparent Consumption of Boron Compounds in Short Tons from 1949 through 1957

Year	Sold or Used by Producers[1] Gross Weight	B_2O_3 Content	Exports[2]	Apparent Consumption[3]
1949	467,592	139,200	109,491	358,101
1950	647,733	191,000	142,580	505,167
1951	862,797	241,000	213,445	649,353
1952	583,828	169,100	103,292	480,536
1953	715,228	213,300	139,317	575,911
1954	790,449	230,500	205,614	584,835
1955	924,496	293,165	222,828	701,668
1956	995,000[4]	310,000[4]	245,000[4]	750,000[4]
1957	1,075,000[5]	340,000[5]	275,000[5]	800,000[5]

1. U.S. Bureau of Mines, Mineral Reports. 2. U.S. Bureau of Census, Report No. FT-410. 3. Quantity sold or used by producers less exports. 4. Estimated. 5. Projected.

F. W. LIBBEY
Consulting Mining Engineer, Portland, Oregon

CHROMITE

"Approximately 138,000 long tons of the 200,000 originally scheduled were delivered by year's end"

Published statistics on chromite by the U. S. Bureau of Mines (to February 19, 1957) cover only 11 months of 1956. During that time, imports totaled 1,987,942 short tons compared with 1,827,960 short tons for all of 1955. Consumption for 11 months of 1956 amounted to 1,670,385 short tons compared with 1,583,983 for all of 1955.

Important chromite mining events for the year for major producing states were:

Alaska: Phil R. Holdsworth, commissioner of mines, reports that the average grade shipped by Kenai Chrome Company, the only producer, was about 45 percent Cr_2O_3 and 2.6 to 1.0 chrome-iron ratio. The company's new mill to concentrate disseminated ore is scheduled to start early in 1957.

California: The State Division of Mines reports that the government's carlot buying program is an important factor in maintaining production of chromite in California. Chrome producers in the state believe that the program benefits both the producers and the government.

Montana: The U. S. Bureau of Mines statistics show that since start of operations in August 1953, the American Chrome Company has delivered 373,000 tons on its government contract to deliver 900,000 short tons of concentrates by December 31, 1961. A renegotiation of contract price from $34.97 to $32.62 per ton was effected late in 1955.

Oregon: The State Department of Geology and Mineral Industries reports that a chrome ore body in the Oregon chrome mine in Josephine County was discovered by the owner, W. S. Robertson, and put in production. The John Day district of Grant County produced 1,533 long dry tons of ore and concentrates valued at $167,390 or an average of $109.00 a long ton.

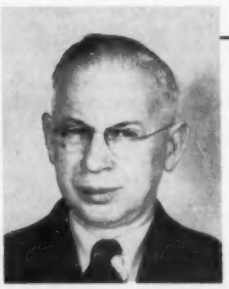
Summary: It was announced in May 1956 by the Office of Defense Mobilization that the chrome purchase program would be extended to June 30, 1959. It is estimated that approximately 18,000 long tons of the 200,000 originally scheduled were delivered by year's end, leaving a balance of about 62,000 long tons to be purchased. At the present rate of production the axe would fall about October 1958.

The case-hardened chrome miner has little hope that anything of benefit to him will come out of the long-awaited long-range government plan to stabilize the mineral industry. Also, it appears unlikely that official Washington, in the absence of an emergency, will get down through the various upper-crust layers of the industry to the little fellows like the chrome miners.

United States Production and Value of Chromite Produced in 1955 and 1956[1]

State	1955		1956	
	Short Tons	Value	Short Tons	Value
Alaska	7,082	$ 625,340	7,200	$ 704,000
California	22,105	1,834,277	25,000	2,074,500
Montana	118,703	3,718,882	121,000[2]	3,790,930[2]
Oregon	5,341	463,514	8,330	709,000
Washington	22	1,706	25[3]	2,000[3]
Totals	153,253	$6,643,719	161,555	$7,280,430

1. Estimates for 1955 by U.S. Bureau of Mines. Preliminary estimates for 1956 by U.S. Bureau of Mines except as noted.
2. Tonnage and values for Montana not included in government purchase program involving 200,000 long tons; tonnage delivered under this program amounts to about 40,550 short tons for 1956 or approximately 36,500 long tons, leaving about 62,000 long tons to be purchased after January 1, 1957.
3. Tons and value for 1956 estimated by author.



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COBALT

"It is expected that Battelle's cobalt center will undertake research leading to new uses"

Cobalt in 1956 moved into an easier supply position accompanied by a reduction in price of the metal from $2.60 to $2.35 per pound on December 1st. Increasing world output is forcing producers to find new outlets and to provide stimulation of consumption in existing uses by means of price reduction.

The United States Government through GSA issued a directive for bartering of surplus farm stocks for strategic stockpile commodities, cobalt being included.

A Cobalt Information Center was established at Battelle Institute, Columbus, Ohio, by leading world cobalt producers for the purpose of collecting and providing information on cobalt and its alloys. It is expected that Battelle's cobalt center will undertake research leading to new uses.

The U. S. Bureau of Mines has produced by an electrolytic process cobalt metal of 99.99 percent purity which will be most helpful in fundamental research.

Esso Research and Engineering reveal that gasoline and new lubricating oil additives have been produced by gamma radiation using a cobalt pipe made radioactive by a 2½-year-long neutron bombardment-intensity of 3,100 Curies.

An important increase in the use of cobalt oxide used in enamel frits has developed through the use of porcelain enameled panels as basic building materials. A panel 1¾ inches thick, consisting of two enameled sheets separated by an insulating material, is equivalent to 18 inches of masonry.

The Freeport Sulphur Company's project at Moa Bay, Cuba, proposes to extract the nickel and cobalt values in the limonite by a combination process of sulphuric acid and the Chemico process as used at Sherritt Gordon Mines Limited at Fort Saskatchewan, Alberta, Canada. Ore reserves are estimated at 50,000,000 tons, containing 1.3 percent manganese, 0.14 cobalt, and 46.5 iron.

Calera Mining Company progressed during 1956 in its objective of improving metallurgical and mechanical problems in the pressure leaching of the arsenical cobalt concentrate from its Blackbird mine, Lemhi County, Idaho. Production was at the rate of about 125 tons of cobalt metal per month. Calera propose to produce 8,000 pounds per day of electrolytic cobalt of high purity.

Union Minière du Haut-Katanga initiated construction of the Luilu Works, in the Belgian Congo which will treat the rich copper and cobalt ores of its Western mines. The plant is 14 kilometers west of Kolwezi.

Kilembe Copper Cobalt Ltd. in Uganda progressed most satisfactorily to rated capacity of its various departments. The concentrating mill is handling near the rated capacity of 1,335 tons daily. The concentrates are carried eight miles by pipe line to the roast-leach plant at Kasese. The calcines will go by rail to the smelter at Jinja.

Chibuluma Mines Ltd.'s concentrator at the mine site in Northern Rhodesia came into production in May 1956 and has a capacity of 40,000 tons per month. Ore reserves are estimated at 7,300,000 tons at an average grade of 5 to 23 percent copper and 0.25 cobalt. Cobalt production is forecast at 500 tons per year. Copper concentrates travel by road and rail

World Mine Production of Cobalt by Countries in 1952, 1953, 1954, 1955, and Estimated 1956 Production Measured in Short Tons

Country	1952[1]	1953[1]	1954[1]	1955[2]	1956[3]
Australia	12	12	12	12	12
Belgian Congo	7,514	9,105	9,414	9,424	9,450
Canada	709	875	1,092	1,496	1,500
Morocco (French)	1,100	660	811	838	750
Northern Rhodesia	644	762	1,264	1,100	1,204
United States	417	885	1,300	1,298	1,770
Total	10,396	12,299	13,893	14,168	14,686

1. U.S. Bureau of Mines' *Minerals Yearbook.*
2. Minerais et Metaus—Paris.
3. Estimated.

to Mufulira Copper Mines, Ltd. while the cobalt concentrate will be processed to cobalt matte at Ndola Copper Refineries Ltd., constructed in 1957 at Ndola, 45 miles from the mine.

Societe Minière de Bou Azzer et du Graara, which operates a cobalt mine in the Atlas mountains of Morocco, expects to receive state aid in building a concentrator plant in Casablanca. The ore will be concentrated by the chlorine process. A new washing plant requiring a 20-mile pipe line has been installed and will enable production to be increased from 7,500 to 10,000 tons per year. The delay is caused by both technical and political reasons.

Cobalt Percentage Uses by Years—United States

Year	A	B	C	D	E	F	G	H	I
1946	10.2	36.4	12.8	1.8	0.8	10.0	5.0	22.4	0.60
1951	4.0	21.0	47.8	8.0	3.0	5.2	0.4	10.0	0.60
1950	5.8	35.2	27.0	6.0	1.8	9.0	3.8	12.0	0.40
1952	3.1	15.5	59.2	10.3	1.2	2.8	0.78	6.5	0.62
1953	3.5	22.4	49.4	9.0	2.2	3.5	0.80	8.5	0.70
1954	3.8	29.0	37.4	8.1	1.5	5.6	1.97	10.07	1.03
1955	3.7	30.3	35.3	8.0	3.0	5.8	2.30	10.80	0.80
1956	3.9	29.2	34.5	9.2	3.9	5.6	3.40	9.20	1.10

LEGEND: A—High speed and other steels. B—Permanent and soft magnet steels and alloys. C—Co-Cr-W-Mo alloys. D—Alloy hard facing alloys and cemented carbides. E—Other metallic uses. F—Ground coat frit. G—Pigments. H—Salts and driers, etc., and I—Other non-metallic uses.

Cobalt Consumption in the United States

Year	Pounds	Year	Pounds
1950	8,283,408	1954	7,350,223
1951	9,932,993	1955	9,740,522
1952	10,818,493	1956 (Estimated)	9,372,400
1953	10,748,499		

COPPER

T. E VELTFORT
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"It is estimated present copper sources will be sufficient for at least 20 years"

In 1956 the copper industry realized a period of adjustment and stabilization. This was in notable contrast to the preceding year when a record demand for copper, coupled with a decrease in anticipated production, caused a worldwide tight copper market. In 1955 an unprecedented European demand for copper had forced foreign prices far above domestic levels. The tight market began to ease in early 1956, however, when new copper from operations began several years earlier became available and when increased production schedules were put into operation. Soon after the first quarter of 1956 enough copper was being produced to meet all user requirements. As conditions continued to improve, with copper supplies sufficient to meet increasing needs, the excessively high market prices both abroad and in the United States fell sharply. In the third quarter, a general business decline, together with a strike in the steel industry, effected a drop in domestic copper consumption. This, in turn, caused further decreases in copper prices. Delayed activity in the automobile industry and decreasing residential construction tended to sustain the lower price trend.

Mining facilities were expanded during the first half of 1956, new properties were put into operation, and production was increased at existing plants. After mid-year, when copper supplies had become more than adequate to meet users' needs, overtime production was cut back in adjustment to falling market conditions. Nevertheless, the lag in general business, particularly in the automobile industry, led to a surplus in copper. Besides supporting a price decline, the surplus induced the United States Commerce Department to lift restrictions on copper exports. The market level at year-end tended toward greater stabilization and, barring any major world crisis, this trend should continue. The three-year, no-strike, labor contract achieved at most United States mines last summer is another factor which will help to stabilize the industry. The possibility of a copper shortage is now remote since domestic producers are in a free position to utilize their increasing facilities as the demand warrants.

Although brass mill shipments in 1956 fell off to some extent from the high figures of 1955, the year was a successful one from several viewpoints. New products were developed, brass mill facilities were expanded, and new production methods put into operation. The brass mill industry will continue to expand and improve its fabricating operations in line with developments in industry in general.

It is estimated that present copper sources will be sufficient for at least 20 years; nevertheless, the year was marked by unprecedented activity in the search for unknown ore bodies. Larger exploration expenditures were allocated and new techniques employed by the major copper producers. Aerial photography and new electro-magnetic devices were among the methods used to prospect territories heretofore inaccessible. This, along with recently developed techniques for extracting copper from low grade deposits, indicates that enough ore will be found to more than offset depletion.

Important research was conducted on a wide scale during 1956 to add new uses for copper. Still under investigation is the behavior of copper alloys at temperatures as low as minus 180° C. and the possible applications of new superhardened coppers obtained by bombarding sheet copper with atomic particles. The effects of recently developed metals, such as zirconium, when added to copper also are being investigated.

Significant advances were made by the brass mills last year. Among the new products introduced was one designed in the form of a single strip or sheet, containing inflatable tubes that are located and sized to a buyer's specifications. Its many uses include employment in air conditioning condensers and evaporators. Other recently developed products include a high strength nickel brass brazing rod and a higher quality phosphor bronze in sheet and wire forms. One brass mill produced an extruded I-shaped structural mullion larger than had been previously considered practical. The new extrusion was created for use in the bronze Seagram building now being built in New York City. The 38-story skyscraper will be the first such structure with a bronze curtain wall. A 19-story office-apartment building, Price Tower, was built by Frank Lloyd Wright in Oklahoma last year. Its facade is composed basically of preoxydized copper. It is likely that both Price Tower and the Seagram building will stimulate wider use of copper and its alloys in contemporary architecture.

There are reasons to be optimistic about the outlook for 1957 as well as for ensuing years. Trends in business, personal incomes, consumer spending, and population figures appear to be going steadily upward. If these trends continue, copper consumption will undoubtedly reach new highs. Major copper-using industries, such as electric power and electrical manufacturing industries, expect continued increases in electrical consumption because of the development of new devices and applications, a wider distribution of them, as well as from the growing use of automation in general industry. Copper consumption should also rise in the automotive and construction industries during 1957.

The capacity of the copper industry to meet an ever-increasing demand may be indicated to some extent by its notable success in overcoming the problems which, not long ago, made the market an unstable and divided one. Moreover the industry has set up extensive, long-range development programs that appear quite adequate for future needs.

This generally optimistic outlook must be balanced by a consideration of adversities that might occur. Barring a disaster, such as major war or depression, these derive mainly from uncertain political conditions in localized areas of the world, particularly the Middle East, where an extended oil blockade could reduce the European copper market greatly. Mining and exploration activities must be concerned with local political conditions, as well. Difficulties are not expected to be unduly serious, however, and the prospect for 1957 and following years appears to be good, promising continued growth in production and consumption throughout the world. Domestic and foreign copper consumption during 1956 totaled approximately 2,775,000 tons, or about 59,000 tons more than during the previous year. United States consumption totaled about 1,425,000 tons, an increase of 7,000 tons above 1955 consumption. Free world copper production in 1956 was over 3,000,000 tons, an increase of about 10 percent over 1955 production. In 1957 production capacity is expected to reach as high as 3,500,000 tons, with long-range estimates reaching 4,000,000 tons by 1962.

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DIAMOND

"Increased demand for diamonds has been a powerful incentive to increase production"

World production of diamonds during 1956 reached an all-time record high. Although production figures for the year are not available at this time for most countries, total production can be estimated to be of the order of 23,500,000 carats, which means an increase of roughly 2,000,000 carats, or nine percent, over the previous year.

Increased demand for diamonds on world markets, where there was in fact a shortage of gems and industrials, has been a powerful incentive to increase production wherever possible. However, owing to the inelasticity of diamond production, this was not easily done, and required considerable capital investments in equipment.

No major discoveries of unknown deposits were reported, if we exclude the much publicized Siberian diamond finds on two tributaries of the Lena River, which cannot be verified and are still in the prospecting stage.

BELGIAN CONGO: For more than 20 years Belgian Congo has been the largest producer of diamonds (in quantity, not in value) more than 60 percent of world production being mined in this country.

Diamond production in Belgian Congo reached the 14,000,000 carats mark in 1956, which means a progress of 1,000,000 carats, or 7.7 percent, over the 1955 production. This is the result of the very high degree of mechanization attained at the Bakwanga mine of the Sociète Miniere du BéCéka, most important producer of industrial diamonds in the world. About 13,380,000 carats were mined at Bakwanga in 1956, against 12,413,198 carats in 1955; about 98 percent were industrial diamonds, mostly crushing boart.

On the Kasai alluvial fields, where mining operations are carried out by the Forminière Company, the output during 1956 remained at approximately the same level; it amounted to about 627,000 carats. This production contains a higher percentage (30 to 35 percent) of gemstones.

LIBERIA: Exports from this African republic were of unexpected magnitude, and account for the second largest increase in 1956 world production.

It is common knowledge that most rough diamonds exported from Monrovia originate in the rich Sierra Leone alluvial diggings, and are smuggled into Liberia over the extensive border. Liberian export figures for 1956 are not available, but it is known that 800,000 carats of rough gem diamonds were officially imported in Belgium from Liberia during 1956, and it may be estimated that Liberian exports to all countries were around the 1,000,000 carats level, not counting the clandestine export. This means a progress of 800,000 carats over the 1955 export. The amount of actual Liberian diamond production included in these exports cannot be estimated, but is not thought to be very large, as small-scale diamond digging by African groups using hand methods was reported for the first time last year.

The finest and most valuable gem diamonds are produced in the Union of South Africa and South West Africa. These countries together have an output of roughly 3,500,000 carats or 16 percent of world production, but the high quality of the stones places them at the top of producing countries, accounting for about one third of total world sales value.

SOUTHWEST AFRICA: A higher production figure is expected, owing to the increased milling rate made possible at the Consolidated Diamond Mines of S. W. Africa by the modern earth-moving equipment and treatment plant which have now been at work for a full year. Monthly output is reported to be as high as 75,000 carats.

UNION OF SOUTH AFRICA: The four pipe mines of De Beers Consolidated Mines at Kimberley, and its associate, Premier (Transvaal) Diamond Mining Co. at Cullinan, near Pretoria, account for about 85 percent of the Union's diamond production. The balance is found in alluvial diggings in both Transvaal and the Cape Province, and in the state alluvial diggings in Namaqualand, which belong to the government.

Monthly production during the three first quarters was reported to vary from 177,000 carats in May to as high as 240,000 carats in March and July, but averaging about 220,000 carats. The total for 1956 is expected to be comparable with the 1955 figure, which was 2,600,000 carats.

GOLD COAST: It is known that the African alluvial diggings in the Tarkwa and Oda districts of the coastal region produced about 1,380,000 carats during 1956, an increase of 300,000 carats over the 1955 African output. To this should be added the production of the companies, most important of which is CAST (Consolidated African Selection Trust) which mined 978,000 carats in 1955. The 1956 figure is not available but assuming it to be comparable, total Gold Coast production will exceed 2,500,000 carats. It contains between 80 and 85 percent industrial diamonds, mostly suitable for drilling or diestones.

SIERRA LEONE: Official production figures have little significance. The Sierra Leone Selection Trust, a subsidiary of CAST, possessed the exclusive diamond mining rights in the territory, but relinquished these rights in 1955 except over a 450 square mile area, for a compensation of £1,570,000 from the government. This agreement was made with the object of dealing with the growing illicit mining of diamonds in the company's concessions. Following this, licensed Africans were permitted to dig for themselves in certain areas, which caused a "diamond rush" to the Kono district, resulting in widespread unlicensed diamond mining, illicit buying, and smuggling on an unprecedented scale (see Liberia).

A subsidiary of the Diamond Corporation, London, the Diamond Corporation Sierra Leone Ltd. established in 1956, opened buying agencies, but the qualtity of diamonds purchased under the buying scheme was not disclosed. As these will come in addition to the normal output of the Selection Trust mines, we may assume the total official production figure to be something of the order of 600,000 carats. Actual production, however, including illicit diamond mining and smuggling, is estimated to be more than double this figure.

ANGOLA: This Portuguese overseas province maintained its high production rate of the previous year, producing in 1956 about 740,000 carats. About 60 percent of the stones mined in Angola are gem diamonds. "Diamang" (Companhia de Diamantes de Angola) holds the exclusive diamond mining and prospecting rights.

TANGANYIKA: Diamond exports up to end of November 1956 totalled 319,000 carats, which seems to indicate progress in the yearly production figure. The new large-scale recovery plant recently completed at the Mwadui mine (a pipe mine located south of Lake Victoria) of Williamson Diamonds Ltd., will permit the treatment of between 7,000 and 7,500 tons of gravel daily, and is expected to increase appreciably the country's diamond production, more than 50 percent of which is gem material.

FRENCH AFRICA: Production in both territories is expected to have made progress in 1956. French Equatorial Africa (Oubanghi-Chari) produced 115,000 carats for the three first quarters, and the total for the year is thought to be near 150,000 carats. French West Africa (Guinea and Ivory Coast) produced 174,000 carats in the first half of 1956; the year's total has probably equalled or exceeded the high 1955 figure.

BRAZIL: The amount of production must be guessed, since no diamond production or export statistics have been published for years, and exports are 100 percent clandestine. According to credible Brazilian sources, production is in excess of 300,000 carats. The largest producing State is Matta Grosso, followed by Minas Gerais, and Bahia. About half this production is cuttable gem diamond.

VENEZUELA: Production in 1955 registered a 45 percent increase over the previous year, with 141,147 carats, but it is still doubtful whether this level was maintained in 1956. Diamond mining is done by several thousand independent diggers, whose individual productions have to be added up. The same may be said about BRITISH GUIANA which produces about 30,000 carats yearly. Lower output is forecast for 1956.

Three minor producers are INDONESIA, INDIA, and AUSTRALIA, accounting together for about one one-thousandth of world production.

During 1956, total diamond sales made through the Central Selling Organization on behalf of the producers reached an amount of £74,546,010, the highest on record. The Diamond Trading Company sold £50,542,240 of gems, and Industrial Distributors (Sales) Ltd., sold £24,003,770 worth of industrial diamonds during the year. These sales are said to account for about 95 percent of the world total.

Mine Production of Diamonds By Countries In Metric Carats For 1954, 1955, and 1956[1]

Country	*1954*	*1955*	*1956*
Belgian Congo	12,619,398	13,041,487	14,000,000
South Africa	2,858,688	2,628,916	2,600,000
South West Africa	683,560	812,848	900,000
Ghana (Gold Coast)	2,135,459	2,258,270	2,500,000
Sierra Leone	400,076	418,077	600,000
Liberia[2]	19,305	203,543	1,000,000
Angola	721,606	743,378	700,000
Tanganyika	326,009	325,523	300,000
French Equatorial Africa	152,528	136,900	100,000
French West Africa	217,650	318,400	300,000
Brazil[2]	250,000	300,000	300,000
Venezuela	96,983	141,147	200,000
British Guiana	30,073	33,300	
Other countries[1]	10,000	15,000	
Totals	20,521,335	21,376,789	23,500,000

1. Estimated. 2. Exports.

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FLUORSPAR

"Consumption of fluorspar in 1957 is expected to equal, if not exceed, record 1956 tonnage"

The domestic demand for fluorspar continued its steady increase and indications are that such demand will continue to rise throughout 1957. The "sour note" in the picture, for independent domestic producers, is the lessening participation of their product because of inability to profitably compete. Imports, based on the U. S. Bureau of Mines figure for nine months, will attain the largest tonnage in history.

In March the President announced, on the basis of the U. S. Tariff Commission Report, that "no escape clause relief to be necessary at this time." The result appears to be that foreign producers accelerated their activities to take over even more of the domestic market.

U. S. Bureau of Mines statistics indicate for the nine-month period through September general fluorspar imports exceeded any previous annual importation; 377,096 short tons were imported as compared to 363,421 short tons for year 1955. A calculated estimate of the total 1956 importation indicates 502,795 short tons. Similarly a calculated consumption for 1956 resulted in 611, 349 tons, and represents an increase of 9 percent over 1955. Despite this record-breaking consumption, imports accounted for 502,795 tons, hence left only 18 percent to be supplied by the domestic industry.

U.S. Production, Imports, and Consumption of Fluorspar All Grades in Short Tons for Years 1951 Through 1956

Year	Domestic Production	Imports for Consumption[1]	Consumption[2]
1951	341,300	181,275	497,012
1952	345,400	352,503	520,197
1953	322,800	359,569	586,798
1954	247,700	293,320	478,641
1955	291,275	363,421	566,636
1956[3] (9 mo.)	232,883	377,096	458,512
1956[4]	310,510	502,795	611,349

1. Includes Government purchases. 2. Excludes Government purchases. 3. Nine months actual. 4. Estimated.

According to recent survey made by R. E. VanAlstine (United States Geological Survey for the Office of Defense Mobilization), United States fluorspar reserves are estimated to be about 22,500,000 short tons containing 35 or more percent calcium fluoride, or the equivalent value in combined fluorspar and metallic fluorides; about 61 percent of the 22,500,000 tons is measured and indicated with the remainder as inferred ore. These reserves represent an increase of approximately 30 percent over those estimated at 17,500,000 tons in 1954; and 50 percent over those estimated at 15,000,000 tons in 1952.

VanAlstine also estimated an additional 12,000,000 tons of lower grade material containing from 15 to 35 percent of calcium fluoride.

After the President's announcement in March the 84th Congress, 2nd Session, enacted Public Law 733 under which acid-grade fluorspar, together with certain other minerals and metals, were to be purchased by General Services Administration for stockpiling to provide for the "maintenance of production of those minerals-metals in the United States."

The stockpiling program contemplates purchasing up to as much as 250,000 short tons of acid-grade fluorspar to be delivered by December 31st, 1958. As of December 31, 1956 only about 8,000 tons had been delivered to stockpile under Public Law 733. G.S.A. price for acid-grade fluorspar of $53.00 per short ton f.o.b. shipper's facilities, is $5.50 per ton above the domestic price that obtained in 1956, and $3.00 per ton above current market.

Inasmuch as the 1956 Congress made available inadequate funds for implementing the program, the domestic industry is hopeful the present Congress will appropriate necessary additional funds.

Although sufficient funds were made available for the metallurgical stockpile program announced in 1954 implementation of the purchases has been delayed repeatedly because of a variety of factors such as stringent specifications and prices. These factors are being resolved slowly so that this program may make some progress in 1957.

Under the provision of Section 7 (b) of the Trade Agreement Extension Act of 1955 (Public Law 86, 84th Congress, 1st Session) the non-captive domestic producers filed on June 21st, 1955 their Application for a Hearing and Investigation to determine whether "any article (fluorspar) is being imported into the United States in such quantities as to threaten to impair the national security . . ."; through action by both industry and O.D.M. this Hearing has been postponed several times to observe whether the Administration's efforts under Public Law 733 would afford adequate relief from imports.

Consumption of fluorspar during 1957 is expected to equal, if not exceed, the record tonnage of 1956. Despite this increase the domestic industry, caught between increasing costs at home and low-prices on imported material, continues with the struggle whether the flood of imports will compel a virtually complete shutdown or some reasonable balance will be found to assure the domestic industry sufficient health and resilience to live and respond to any National emergency calls that may be made upon it.

FRANK LILLY
Research Statistician U.S. Gold Committee, Spokane, Washington

"This left only the United States, along with Russia and China, without a Free Gold Market"

Although 1956 was another year of frustration and disappointment for United States gold producers, gold in its relation to the world monetary situation and with particular reference to United States gold holdings and policies, received more attention than at any time since 1933 and 1934 when the price, after almost a year of maneuvering, was finally pegged at the "mumbo-jumbo" price of $35.00 an ounce without any study having been made as to the value that should have been assigned to it in order to provide a sound dollar and the convertibility of world currencies that must be achieved before the world's economy can run smoothly and with fairness to all nations.

At the beginning of the year, in answer to the question, "Who Owns The Gold At Fort Knox," which was being asked in many quarters, the *United States News & World Report* pointed out that a close study of this country's gold position showed that the United States was vulnerable in the event of a financial crisis or war because nearly $14,000,000,000 of its gold holdings, totaling approximately $22,000,000,000 were pledged to foreign governments and firms who had that much in business claims that they could convert into gold at any time. Incidentally, it was the flow of gold out of the United States in settlement of a comparatively small amount of foreign business claims that primarily caused the depression of 1931 to 1933 which followed the boom of 1926 to 1929.

A short time later, Murray Shields, formerly consulting expert in the office of the Secretary of the Treasury, also pointed out the involved financial weakness in our situation, saying that:

> "While our gold stock is now only about a billion dollars less than what it was in 1949, the foreign claims on our gold have risen spectacularly. This particular statistic about foreign claims involves only holdings of deposits by foreigners in our banks and holdings by foreigners of government securities with the maturity of one year and less.
>
> "Foreigners also hold vast amounts of additional government securities maturing in from one to five years, as well as equities and corporate bonds. But our net gold stock today—after allowing for short term liabilities to foreigners—is only about $10,000,000,000, whereas in 1949 it was close to 20. That isn't so bad, but when the net gold stock is related to our gross national product, it is clear that it represented in 1949 about 8.0 percent of our gross product, whereas today it represents only 2.6 percent of a much higher gross national product.
>
> "My guess is that sometime in the course of human events we will have to raise the price of gold in order to make our monetary gold stocks more adequate in relation to the need for them. I don't think anyone who has studied the matter doubts that, if we ever get into another serious depression, we would increase the dollar price of gold. And therefore it might well be advisable for us to do it beforehand, rather than to wait. We should be studying the problem now."

Under the heading, "Concern Over U. S. Gold Position," the First National City Bank of New York, in its September, 1956, Monthly Letter, commented in part as follows:

> "The United States, despite record exports and a bigger trade surplus, has continued to incur a deficit in its overall balance of payments, thereby enabling foreign countries to add to their gold and dollar holdings.
>
> "An aspect of the continued growth of foreign dollar holdings of interest to Americans is that, while these dollars constitute assets to their foreign owners, they are liabilities in the monetary system of this country. Concern is occasionally expressed over the growth of such short term holdings and their significance with respect to our gold position.
>
> "This concern is prompted by articles appearing in the press and other publications stressing our vulnerability to sudden gold withdrawals. It is pointed out that foreign short term dollar assets, including deposits and Treasury obligations, total around $14,500,000,000 compared with 31 percent in 1949. The question is asked how long we can afford to go on spending and lending abroad, and piling up these potential claims against our gold stock."

Early in 1956 Belgium set up a free market in gold in that country and a few months later Canada restored to its citizens the privilege of owning and trading in gold. This left only the United States, along with Russia and China, without a free gold market such as now exists in all other leading nations of the world. This fact, as was pointed out, put gold under restrictions similar to those applying to machine guns and narcotics.

Several bills providing for a free gold market in the United States had been put in the Congressional hopper during 1955 and 1956 but no action was taken, not even a hearing called. The fact that a Free Market would not involve any drain upon our gold reserve or in any way change the Treasury's pegged price of $35 an ounce was ignored, just as was the pledge in the 1952 Republican Platform to "provide a dollar on a fully convertible gold basis." Incidentally, Democrat members of Congress have for too long overlooked the fact that President Roosevelt, in one of his famous fireside chats, promised "to establish and maintain a dollar which will not change its purchasing and debt-paying power during the succeeding generation."

The practical aspects of legislative action that would increase the output of gold from United States mines is another matter that has in the main been overlooked by both Democratic and Republican administrations. As a matter of fact, it would almost seem that a studied attempt has been made to hamper gold production in the United States. Certainly nothing has been done to aid or encourage the gold miner, although every other industry has been given treasury aid and/or at the very least a free market for its products.

In such a free market, the leading industrial metals, copper, lead, zinc, and pig iron, have on the average reached and maintained prices more than four times as high as the prices that prevailed for them when in January 1934 the price of gold was set at $35 an ounce. If the price of gold had advanced in line it would now be selling at approximately $140 an ounce.

The effect of hobbling the gold miner with a fixed price of $35 an ounce for his product in the face of increasing costs for material, labor, services and taxes has cut United States gold production from an average of over $148,000,000 a year for the eight years 1935-1942, to approximately $68,000,000 during the last eight years, 1949-1956. This, by the way, is the estimated production for 1956, with about 40 percent of the gold being produced as a byproduct of copper, silver, and lead.

It is of interest to note that, on the average, Treasury's sales of gold for commercial and art uses have exceeded United States gold output. For example: 1952 sales of $127,189,489 compared with a production of $67,445,000; 1953 sales of $112,379,041 compared with a production of $68,950,000; average sales of $99,800,000 for the last eight years compared with average production of $68,000,000.

The Court of Claims decision awarding damages to a group of gold mining companies whose properties were closed by WPB order L-208, which in effect acknowledged that government officials exceeded their authority, was a matter of relief to gold miners who had considered the possibility, however remote, that the government might again issue such an order in the event of another war. It is true that the Court of Claims decision is now on appeal, but there is little doubt but what its decision will be upheld.

On the whole, it can conservatively be said that as a result of the facts on our gold situation that have been aired during the past year the gold skies, which have so long been overcast, are clearing and that some action, probably a free gold market and possibly an upward revaluation of gold, is in the offing.

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"Steel companies sought the best and most economical form of iron agglomerates for blast furnaces"

Losses in iron ore production and shipments because of a nationwide steel strike in July and August were largely offset by increased imports with the net result that 1956 was nearly as good an iron ore year as 1955. Where the upward trend of imports eventually will level off to some sort of balance with domestic production is not an easily answered question because national security considerations enter the picture along with the economic aspects.

An early and strong start of the Great Lakes shipping season was brought to a halt by the 35-day steel strike starting July 1, and the early advantage in moving raw material iron to market was turned into a deficit of 13,500,000 tons as compared to 1955 shipments at midseason. The full-scale resumption of shipping following the steel strike was delayed by a local strike of the crew officers of part of the Great Lakes bulk carrier's fleet that lasted five weeks into September. A concerted effort in the last months of the season aided by favorable weather reduced the final deficit to 10,500,000 tons. The Pittsburgh Steamship Division of U. S. Steel Corporation tried to operate until the end of the year but finally closed the season on December 19 because of ice conditions. This was one of the latest navigation seasons on record. Total domestic shipments came to 94,740,000 gross tons, according to preliminary estimates of the U. S. Bureau of Mines; this was 12 percent less than the total for 1955. The average value of the domestic ores shipped in 1956 was $6.90 per gross ton at the mines as compared with $6.70 in 1955.

Foreign ores filled a quarter of our needs, further confirming our dependence on imports. From the national security point of view, it was comforting that Canada supplied nearly half of the imports. The security angle probably has been as important as economic reasons in the decisions of several United States steel companies to go into large-scale developments of Canadian iron ore properties as the best move in maintaining abundant supplies and competitive positions in high-grade raw materials.

A significant tonnage of taconite pellets reached the market with the first full year of operations at Reserve Mining Company's new Beaver Bay, Minnesota taconite processing plant; these pellets are fully competitive with the high-grade foreign ores. The increased blast furnace outputs achieved through the use of high-grade raw material iron and improved practices of screening and sizing, agglomeration of fines, and bedding are bringing new concepts as to what constitutes an acceptable iron raw material. One result of this trend was a boost in sintering capacity. Another was more research to improve upgrading, sizing, and agglomerating processes to meet the restrictive requirements.

Steel companies sought the best and most economical form of iron agglomerates for blast furnaces. The acute shortage of charge ore for the open hearths directed attention to the development of high-grade agglomerates for this use. Several processes for direct reduction of iron ore were under study. Sponge iron as a substitute for scrap was talked about when scrap prices climbed too high.

As the search for high-grade iron ore deposits continued unabated throughout the world and intensive research into utilization of taconites and jaspilites gained momentum in 1956, the disturbing possibility began to loom that the industry may be over developing itself to the extent that some kinds of ore will be running out of its ears in the next few years. Marginal producers of custom ores were concerned about how much they would be squeezed by the competition from high-grade foreign ores and domestic agglomerates if the demand for raw material iron weakens.

United States production of usable iron ore and agglomerates came to 95,646,000 gross tons in 1956, according to preliminary estimates of the U. S. Bureau of Mines; this compared with 104,404,000 gross tons in 1955. Following an historic pattern, the Lake Superior states (Minnesota, Michigan, and Wisconsin) produced 78.5 percent of the total; the remainder came from 14 other states. The western states produced 14 percent more than in 1955 while the southeastern states produced 20 percent less.

Minnesota's production of 60,661,500 gross tons was 63 percent of the total for the United States as compared with 67 in 1955; shipments were 60,412,300 gross tons. Michigan was the second producer with 12,885,900 gross tons, a slight increase over 1955, but shipments of 12,334,500 gross tons were 13 percent less than in the preceding year. Alabama was in third place with a production of 5,813,000 gross tons.

Reserve Mining Company's new taconite plant produced 3,584,736 gross tons of pellets in 1956. The last of six pelletizing furnaces went into operation in February, and other construction was completed in March. The plant was formally dedicated as the E. W. Davis Works on September 13. The annual capacity of 3,750,000 gross tons of finished pellets will ultimately be expanded to 10,000,000 tons. The pilot plant at Babbitt turned out 291,000 gross tons of pellets.

Construction of Erie Mining Company's taconite plant near Aurora, Minnesota, was reported 75 percent complete at the end of 1956; initial production is expected in 1957. With a rated annual capacity of 7,500,000 tons of finished pellets, this will be the largest taconite concentrator ever built as a single unit. The pilot plant at Aurora which has been in operation since 1948 continued to product pellets—227,994 gross tons during the year.

Oliver Iron Mining Division of U. S. Steel Corporation produced 676,797 gross tons of taconite concentrate at the Pilotac plant near Mountain Iron, Minnesota, and agglomerated it at the Extaca plant at Virginia.

Stripping operations were underway at several new mines in Minnesota. Oliver Iron Mining Division pushed large-scale stripping at the Stevens mine near Aurora; this is considered the largest undeveloped reserve of direct shipping ore on the Mesabi Range. Several new washing, cyclone, and heavy media units were in initial production or under construction, and plans for others were announced. A plant was under construction for treatment of tailings in the Hill Annex and Arthur mine basins; in this operation, unique to the Mesabi range, the tailings will be mined by hydraulic dredge and treated by spirals and flotation.

A few statistics about the Mesabi Range are worthy of attention. Total tonnage mined from this range passed the 2,000,000,000 mark in 1955. There were 22 companies operating 131 mines in 1956, the 64th year of shipments. Reserves of shipping and concentrating ores were estimated to exceed 800,000,000 tons. This prolific and reliable reservoir of iron ore has helped decide two global wars and is a basic factor in our worldwide industrial supremacy.

Most of Michigan's production came from underground mines; however, the Humboldt Mining Company's open pit was in steady operation and the flotation plant produced 212,251 gross tons of concentrates. The Marquette Iron Mining Company (Cleveland-Cliffs Iron Company and associates) put a second open-pit mine and plant into operation on the low-grade jaspilite ores of the Marquette Range; the Republic flotation plant has an initial annual capacity of 550,000 gross tons of concentrates averaging 63 percent iron and 8 silica. Cleveland-Cliffs also completed the Eagle Mills agglomerating plant and late in the year began pelletizing the Republic concentrates. This plant uses the "Flying Saucer" to ball the fine concentrates, instead of the drums featured by the Minnesota taconite plants. The updraft travelling grate is capable of handling 2,000 gross tons of pellets daily. Cleveland-Cliffs started pilot plant studies of magnetic conversion of low-grade hematitic ores in a 3-foot fluosolids reactor. The M. A. Hanna Company announced plans for a 20-foot-diameter circular shaft 2,000 feet deep, to be equipped with friction-type hoist, for deep development of both the Wauseca and Homer mines. The company also announced that pilot plant studies would be reopened at the old Groveland mine on the Menominee Range.

Several companies were active in testing the low-grade iron formations of Ashland County, Wisconsin, near the towns of Butternut and Mellon.

Department of Commerce statistics showed iron ore imports of 29,275,934 net tons in the first 10 months of 1956 as compared with 26,285,631 in all of 1955; the total for the year was estimated to be about 34,000,000 tons, a 30 percent increase over 1955. Much of the increase came from Canada

which supplied 47 percent of the total imports for the first 10 months of the year. Venezuela was in second place and showed a notable increase in shipments. Peru, Chili, Brazil, Sweden, and Liberia also were important suppliers. A number of circumstances led to the increase in imports, including the high level of domestic steel production, the strong demand for ores of high quality, and the increasing availability of the foreign ores. The average export value (not the landed cost) of the ores for the first 10 months of 1956 was $7.36 per net ton as compared with $6.75 per net ton for all of 1955.

Canadian production of iron ore and agglomerates totalled about 21,000,000 gross tons in 1956. The Iron Ore Company of Canada was expected to ship 12,000,000 to 13,000,000 gross tons of high-grade ores, and Steep Rock Iron Mines, Ltd. was in second place with 3,300,000 gross tons. Production from the Quebec-Labrador fields will be boosted to 20,000,000 gross tons by 1960, and when Caland Ore Company, Ltd. starts producing about that time, the yearly output of the Steep Rock area will jump to 10,000,000 gross tons. Dominion Wabana, and Algoma Ore Properties had productions in the millions of tons in 1956. Pellets came from Bethlehem Steel Company's new Marmora plant and International Nickel Company's new $19,000,000 byproduct plant; the INCO pellets analyzed 68 percent iron, 1.5 silica, and 0.003 phosphorus. Exploration and development kept pace with the increasing production. Canada's contiguity, proximity to United States markets, and history of friendly relations encouraged large-scale developments of the low-grade deposits as well as the high-grade ones, and practically all of the United States steel and iron ore mining companies were getting into the picture in searching for low-grade ores suitable for concentration and agglomeration. Cartier Mining Company, a subsidiary of U. S. Steel Corporation, announced that a $200,000,000 development will be undertaken in the Mt. Wright area of Quebec; the company has been diamond drilling the iron formations there and conducting beneficiation tests for two or three years. This province was the scene of many other iron ore exploration and development activities.

The South American production came from Orinoco Mining Company's Cerro Bolivar deposit and Bethlehem's El Pao deposit in Venezuela; Utah Construction Company's Marcona Mine in Peru; and the Vale de Rio Doce deposits in Brazil. Republic's Bomi Hills Mine in Liberia was a steady producer.

OTTO HERRES
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LEAD

"Production and consumption of lead probably will continue to prove relatively stable"

Lead fared somewhat better than the other nonferrous metals in 1956. Consumption was relatively stable; total United States supply was about unchanged from 1955, and price steadiness was supported by government stockpile purchases of surplus supplies. Imports of ore and concentrates were the highest for any year, and production of refined lead jumped sharply over 1955.

Production of refined lead in the United States from domestic and foreign ores for the year 1956 amounted to 613,293 tons, the largest total since World War II when the output was 633,818 tons in 1942. This marks a sharp increase over the 547,153 tons produced in 1955 when operations were interrupted for six weeks by smelter and refinery strikes.

Consumption of refined lead fell off slightly to 524,848 tons from 531,339 tons the year before, reflecting effect of the steel strike and the fewer number of automobiles manufactured. Exports have been of little consequence in recent years, but rose to 4,051 tons from a low figure of 72 tons in 1955.

Production exceeded shipments for consumption and exports by 84,000 tons indicating the extent to which the lead industry was dependent on United States government stockpiling to keep supplies in balance with consumer demands. Primary producers', stocks reached a peak of 176,500 tons in July but declined to a more normal total of some 160,000 tons in December. Consumers' and secondary smelters' stocks also declined and were around an estimated 100,000 tons at the close of the year.

Domestic mine output of recoverable lead rose slightly in 1956 to approximately 350,000 tons as compared with 338,025 tons for the year 1955, but remained below the average of any of the past five decades. In contrast, lead content of imported ores and concentrates also rose in about the same amount, but to an all-time high of some 197,000 tons, against 177,479 tons in 1955.

Imports of foreign metal declined slightly to around 241,000 tons from 264,149 tons for 1955. Recovery of secondary lead from battery scrap, old cable, sheet and the like, and from alloy scrap, is estimated to have increased slightly to approximately 500,000 tons.

Industrial consumption of lead is estimated at 1,180,000 tons, off very little from 1,206,000 tons in 1955.

The New York price of lead was unchanged at 16 cents a pound all year with the exception of a few days early in January when the price was influenced by an increase in the London market and rose temporarily to 16½ cents. Government purchases of lead for the defense stockpile and bartering of surplus farm products for foreign metal stabilized the price at about 70 percent higher than in 1955, but this was offset by wage and other increases in costs.

It will be recalled that in August 1954, the President, in lieu of approving a United States Tariff Commission recommendation for an "escape clause" increase in the tariffs on lead and zinc, authorized the purchase of 200,000 tons of lead for the defense stockpile. Figures are not available, but indications are this total has been reached. It is also probable that tonnages of lead in the defense stockpile for the long-term objective will be covered this year, although these figures also are not published by the government.

The government's Commodity Credit Corporation, however, continues to take foreign lead and zinc in exchange for surplus farm products offered by the Department of Agriculture. No limits have been announced for the agricultural barter program and there is uncertainty as to the amounts that will be taken and how long the program will continue. But in the budget proposed by the President for fiscal 1958, there is provided $245,000,000 to purchase materials for the government stockpile of strategic and critical materials. Of this amount, $69,000,000 is to go for purchases to maintain the mobilization base, and $105,000,000 for materials secured through barter of surplus agricultural products. It would appear, therefore, that bartering surplus farm products for foreign lead and zinc will continue as long as the procedure seems politically expedient.

It is hardly to be expected that prices can fall very far from their present level as long as the United States government barter program provides an outlet for surplus foreign stocks of lead. But it will be noted that imports of lead ore and concentrates were greater in 1955 than in 1954 when the President asked the State Department to see that foreign producers were not to take advantage of the stockpile purchases by increasing their shipments to this country, and the heavy imports of ore and concentrates reached a record high tonnage in 1956.

If purchases of lead and zinc for the defense stockpile are completed in 1957, and barter of surplus agricultural commodities continues to take the world surplus of lead and zinc off the market, the effect would differ only slightly from the present program.

Such a program is beneficial in sustaining prices at present levels, but confronted with surplus world production it fails to compensate for rising costs, now approaching the 12th year of a wage-price spiral. And an end to the stockpile program probably would result in a drastic price drop.

The barter program has much merit in that it trades perishable commodities for useful metals. And with billions of dollars in surplus agricultural products available and a continuing farm price support program, conceivably it could be continued indefinitely. But by putting a floor under the world price it

encourages foreign expansion to the extent that the prices are profitable to world producers.

Experience is proving that stockpiling alone, whether for defense or through barter deals, will not provide a long-range minerals policy that will protect domestic lead-zinc mining from the weakening impact of excess tonnages of foreign lead and zinc flowing to the markets of this country. The logical answer, it would seem, is restriction of excess imports, but only to the extent that they are offered at prices that will not destroy our lead-zinc mining, an industry essential to the national defense and civilian welfare. Otherwise, well-managed mining companies, for continued existence, must tend to abandon development in this country in favor of foreign ventures more advantageous to profitable operation from cost, tax and other considerations, including the barter program of the United States government to sustain their prices.

Although domestic consumption of lead has not kept pace with copper, zinc and aluminum, the outlook appears relatively favorable. Consumption in tetraethyl lead, lead oxides, storage batteries, solder, and atomic shielding is increasing. Future increases in uses of lead probably will follow rather closely the continued growth of the automobile industry, in requirements for storage batteries and high-test gasoline, and needs for lead shielding material in the rapidly developing atomic industries.

From the supply side, important production of lead is from complex lead-zinc ores. New lead-zinc deposits are being developed, but they are mainly zinc producers. Production and demand for lead are rather closely in balance with no large increase in lead production in immediate prospect to upset the balance.

Production and consumption of lead probably will continue to prove relatively stable. Reasonably stable prices also would seem to be assured for some time to come by a continuation of government stockpiling through the agricultural barter program.

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LITHIUM

"Major producers had well over 40,000,000 tons of high-grade ore ready for mining"

Lithium held the spotlight in the financial, technical, and public press through the year of 1956. Factual and fanciful articles appeared from all quarters as suggested uses of the element caught the public's interest.

The industry itself, however, calmly set about digesting the rapid expansion of the previous two years. Lithium Corporation of America smoothly absorbed the new production of spodumene concentrates from Quebec Lithium Corporation. Foote Mineral Company streamlined its productive facilities, American Lithium Chemicals, Inc., a subsidiary of American Potash & Chemical Corporation, commenced production early in 1956 at its new extraction plant near San Antonio, Texas, and Maywood Chemical Works continued its established operations.

Perhaps the most important factor confirmed during the year was the assurance to potential consumers of a more than adequate supply of resources and productive capacity for the element. Major producers had well over 40,000,000 tons of high-grade ore ready for mining. In addition, independent prospectors in Ontario, Manitoba, and Northwest Territories of Canada have explored appreciable reserves. Greater and more frequent ore sales offerings were made from Southern Rhodesia, South-West Africa, Brazil, Argentina, Australia, and Spain. No longer is lithium a rare and elusive element.

Armed with resources and confident of the future each of the processors accelerated research to determine the full potential of the element. In this task they were joined by an ever widening circle of industrial laboratories. Such interest was augmented in the formation of American Lithium Institute, a joint venture of Lithium Corporation, Foote Mineral, and American Potash & Chemical Corporation for the purpose of correlating and disseminating data on lithium and promoting research.

Demand for the element took the additional production from American Lithium Chemicals new plant in stride. The now common uses in lubricants and ceramics continued as the leading consumers, but strong increases were noted in air conditioning, brazing fluxes, metallurgy, and catalytic reaction processes.

Projected uses include bleaches, light metal alloys, propellants, fertilizers, cermets, oil additives, electrolyte for aluminum reduction, reducing agents, heat transfer agents, nuclear shielding, self-fluxing brazing alloys, and porcelain enamel coating for aluminum.

Again in 1956, production and consumption figures were not released. The overall consumption of lithium is obscured not only by certain classified uses but also because a significant tonnage of petalite and other minerals are consumed by the glass industry without passing through the extraction stages. Finally, the present trend is away from the basic carbonate and hydroxide to more complex compounds and metal forms, each having variable profit margins. Nevertheless, the advancement of the industry is evidenced by a very substantial increase in gross sales in 1956 by the major processors.

H. G. GRUNSTEDT
Manager
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MAGNESIUM

"New magnesium dry cell batteries should appear on the civilian market during 1957"

The year 1956 was favorable for magnesium. Production increased to over 63,000 tons, indicating a growth of 12 percent over 1955. Technological advancements within the industry as well as improvement in high temperature magnesium-thorium allows brighten future prospects of the industry. Production of the new earth satellite, made primarily of magnesium, has done much to bring magnesium before the eye of the public.

Undoubtedly the most important development in the magnesium industry during 1956 was the formation of a new commercial producer of magnesium in the United States. There is some indication this new plant may be in production during

the latter part of 1957; this production, along with increases from present facilities, could bring production of primary magnesium near the 80,000-ton mark for 1957.

During July 1956, an announcement was made regarding the formation of the Alabama Metallurgical Corporation as a second producer of primary magnesium in the United States. With a planned production capacity of 10,000 tons annually, the $7,000,000 plant will add 15 percent to the country's annual production of high purity magnesium. Owned jointly by Brooks and Perkins, Inc. and Dominion Magnesium, Ltd. of Toronto, Canada, the new producer will have a plant in Selma, Alabama. High purity magnesium will be made by the ferrosilicon reduction process. In this process silicon is used as a reducing agent, reacted in the form of ferrosilicon with magnesium oxide. Magnesium oxide will be obtained from burnt dolomite, abundantly found in Alabama.

Another highlight of the industry was the discovery that high-purity aluminum (99.99 percent) and its alloys with magnesium are susceptible to almost no galvanic reactions, even in highly corrosive surroundings. This is due to the elimination of certain heavy metal impurities from the aluminum and results in an increase in the alkali resistance from this metal. However, the satisfactory application of high purity aluminum coating to magnesium is still a difficult problem.

An increase in both use and interest in the magnesium-thorium alloys for supersonic missiles and aircraft was another important factor in the industry during 1956. Alloys containing magnesium and thorium have been developed for production on a commercial basis to operate in the 500 to 800° F. range. Market demand for high temperature magnesium alloys is expected to reach significant proportions in the next few years.

Again in 1956, civilian uses for magnesium exceeded slightly that of the military. Consumption of primary magnesium was approximately 55,000 tons, which is 19 percent higher than 1955. Non-structural applications, as the alloying of aluminum, refining of nickel, manufacturing of titanium, and chloride protection accounted for over 60 percent of the annual production. Air transportation equipment was the largest market in the structural field. At the rate of consumption during the year, consumers and producers stocks at the year's end were estimated at six months supply.

Total imports of magnesium in all forms during the first 11 months of 1956 were 75 percent below the quantity imported during the same period of 1955. Exports were 54 percent below 1955, and tariff rates as agreed upon during the Geneva Trade Conference were lowered. The price of magnesium was raised to its present 36 cents per pound, compared to a price of 32.5 cents early in 1956.

Domestic consumption again should be higher during 1957, with the increase being divided about equally between structural and non-structural uses. Cathodic protection, already a principal market for magnesium, should continue to expand this year. The largest field of use being in the protection of ship hulls and marine ballast tanks. New magnesuim dry cell batteries should appear on the civilian market during 1957. Previously supplied solely to the military, their prime advantage lies in their high energy output per unit of size and weight, a distinct advantage in the field of electronics and portable lighting.

MANGANESE

F. A. McGonigle
Vice President Manganese, Inc. New York, New York

"On the carlot program 7,568,955 out of authorized 19,000,000 long ton units have been bought"

Manganese, the indispensable metal to improve the surface finish and rollability of steel, the metal that minimizes the deleterious effects of oxygen and sulphur in steel but imparts hardness to it, was exposed to important developments during the year. In summary what happened was:

1. On July 24 the ODM increased the carlot program from 19,000,000 to 28,000,000 long ton units with a new termination date of January 1, 1961.
2. In August the Indian government imposed an export tax averaging 13¢ a long ton unit with the result that all ores of 46 to 48 percent Mn with other usual terms and conditions for import by the United States rose in price from $0.94 to $0.96 to $1.64 to $1.69 per long ton unit.
3. Closing of the Suez Canal boosted freight rates and war risk insurance rates. These increases contributed to the higher price for imported ores.
4. In October the General Services Administration issued new regulations for the carlot program outlining new definitions and limitations for a producer of ores.
5. On the carlot program a total of 7,568,955 long ton units have been bought by the G.S.A. At Butte 2,514,053 long ton units of recoverable manganese are on hand. Deming, New Mexico, and Wenden, Arizona, depots remained closed.
6. Consumption of ore was estimated to be about 2,400,000 short tons, virtually the same as in 1955. Domestic mines supplied about 325,000 short tons of ore, up 36,000 tons from 1955. These figures establish domestic production to have accounted for only 13.5 percent of the nation's needs, or one percent more than last year. Estimated imports were 2,100,000 short tons, virtually the same as the 2,088,420 short tons the previous year.
7. Ferromanganese imports increased to 230,000 net tons over the previous year's amount of 121,329 short tons. The price also went up from 10¾ to 12¾¢ per pound.
8. The Indian tax development slowed down shipments a little on the long term contracts until it could be determined who would pay the average 13¢ tax. No clear cut decision among suppliers, brokers, and consumers was established in every case, but the story goes that the consumer pays about 5¢ with the 8¢ being absorbed by the dealers. The miners it appears contribute nothing. Little new business was arranged because of the high price.
9. India maintained its position of main supplier of ore to the United States, accounting for 32 percent of imports. This amount will decrease in the future if the Indian government pursues its policy of nationalizing industry. The Union of South Africa supplied 12 percent of the imports, and Brazil was third with 11. The combined Cuban (10.4) and Mexican (8) was only 18.4 percent.
10. At year's end the Amapá deposit in Brazil was ready for an annual production rate of 600,000 short tons. It can replace some of the lost Indian tonnage or the dwindling supply from the Nsuta mine in the Gold Coast. Production from the Kisenge mine in the Belgian Congo is increasing, having doubled since 1953. Two new deposits are being developed in Africa. One is in Northern Rhodesia under the direction of the Vanadium Corporation of America and the other is by the United States Steel Company at Franceville, Gabon, in French Equatorial Africa. Mexico's principal producer is the Autlan mine of the Bethlehem Steel Company located near Guadalajara.

In the realm of industrial development, the Manganese Chemicals Corporation in Minnesota was making synthetic battery grade from the Cuyuna Range iron-manganese ores. Stratmat, Inc., was testing a double smelting process for oxide or silicate ores. The U. S. Manganese Corporation was testing its hi-arc electric fuming process on rhodonite.

Other than increasing the carlot program by 9,000,000 long ton units the government gave no incentive for this infant industry to find and develop new ore, or to determine better beneficiation methods. These steps are essential to improve this country's low sufficiency ratio of only 13.5 percent.

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MERCURY

"Output increased nearly 600 percent during last 10 years; practically all from old mines"

The year 1956 was one of remarkable stability for the mercury industry. While the price sank from $275 to $279 a flash to $255 to $257 during the first six months, it remained practically unchanged during the rest of the year. To outsiders this price appears high and has the effect of attracting the uninitiated into the industry. A closer examination reveals that, in terms of purchasing power, mercury is selling for less than it brought during the depression of the 1930's. The increase in wages and fringe benefits, the decreased productivity of the miners, and the increase in supplies and materials costs have more than offset the increased price for mercury.

Following the trend of the last few years, several new domestic mines were opened and some of them were able to make significant production. The Red Devil property on the Kuskowin River in Alaska operated by De Coursey Mountain Mining Company treated high grade ore in a new Pacific Foundry Company furnace and produced at a rate which may make it the largest current domestic producing mine. The Idaho-Almaden Mine near Weiser, Idaho, of Rare Metals Corporation of America, completed its first full year of production. It contributed over 10 percent of the United States production, handling relatively large tonnages of fairly low grade ore from an open pit mine.

Late in the year the old Bretz mine in Oregon, under the name "Arentz-Comstock" went into production with a flotation process. The flotation concentrates are roasted in a D retort. The total daily tonnage treated is 150 to 200 tons, with plans for increasing this materially. Also going into production with a flotation plant, was John Etchart in the old Bottle Creek district in Nevada.

A new rotary furnace was erected on the old Black Butte property in Lane County, Oregon. While the grade of ore appears to be low and operational problems numerous, it is in the hands of competent management and will probably produce significantly in 1957.

Domestic mercury production was estimated at 23,000 flasks with 90 percent of it coming from about 15 mines and the remaining 10 percent from an additional 90 properties. Output has increased nearly 600 percent during last 10 years; practically all from old mines. There have been no new discoveries that have made any appreciable production. The reopening of old mines and the successful exploration of operating properties have contributed nearly all of the increase in production.

Imports from foreign sources have always been a major factor in the United States quicksilver market. During 1956 there was a total of over 50,000 flasks imported, most of this coming from overseas, with Spain furnishing about 18,000 flasks, and Italy about 15,000 flasks. Most of the rest came from Mexico and Yugoslavia.

The general world production from all sources seems to have increased. The total of Spanish and Italian production probably exceeded 105,000 flasks, and Yugoslavia produced about 13,000 flasks. Other foreign production from the Free World was about as follows:

Mexico 21,000, Japan 26,200, Philippines 3,000 and, with the addition of 23,000 from the United States, and scattered minor production, gives a total world production of approximately 175,000 flasks.

While consumption is only estimated, it appears to be about as follows:

United States (official)	50,000
Japan	16,000
West Germany	18,000
United Kingdom	20,000
France	6,500
Poland	4,000
Colombia	2,000
Miscellaneous Consumption	8,500
Total	125,000

In addition to these total world consumption figures it must be assumed that greater Russia and China consumed, in excess of their production, perhaps 20,000 flasks. Also, stocks in the hands of United States consumers probably increased about 10,000 flasks.

This still leaves a world surplus of production over consumption of at least 30,000 flasks. Perhaps this is being absorbed by certain United States government agencies, nevertheless, its use is not known by people in the industry. As long as this apparent overproduction exists and its use is unknown, most domestic producers feel apprehensive about the future of the quicksilver mining industry.

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G. O. ARGALL, JR.
Editor

MOLYBDENUM

"Demand for molybdenum and molybdenum chemicals continued at a high rate throughout the year"

Molybdenum production in the United States in 1956 fell below 1955 output despite record high tonnages of both molybdenum ore and byproduct (copper) ore mined and milled, and first shipments from two new Arizona mines. Production in 1956 was 57,464,000 pounds, compared with 61,781,000 in 1955—well below the all-time yearly peak of 66,437,000 in 1943. Recovery from straight molybdenum ores was down about 15 percent. Copper byproduct was up about 15 percent for an all-time high.

Low-grade ore treated at Climax Molybdenum Company's Climax mine at Climax, Colorado was the main reason for the over-all decline. While Climax increased mill tonnage from 9,227,700 in 1955 to a record high of 9,930,000 in 1956, molybdenum output dropped from 43,043,000 pounds in 1955 to about 37,489,000. It was necessary to mine lower than average mine-grade ore during the year to recover marginal ore and to develop the mine on a planned two-level caving system which precluded mining of higher grade blocks. This was a temporary situation; the new No. 17 grinding unit started early in 1957 will increase mill recovery, and planned draw control in the mine will make higher grade blocks minable on schedule.

Major plant additions and camp improvements were completed during the year. In early summer the No. 10 grinding circuit was started to increase capacity of the mill by 3,500 daily tons. In the mine an ore pass was completed so that Phillipson Level ore could be dropped to Storke Level for drawing, tramming, and crushing before being elevated to the mill. Plans were underway to develop the 600 Level, 300 feet below Storke, at year's end.

Kennecott Copper Corporation's Utah Mine Division remained the second place producer with output about the same as in 1955 from Bingham Canyon copper ores.

Production in Arizona increased from 1,497,000 pounds in 1955 to 2,420,000 in 1956. Increase was due to first output from San Manual Copper Corporation and ASARCO'S Silver Bell unit, both copper mines. San Manuel recovered 591,970 pounds of molybdenums from April to year's end. Total tonnage milled, starting in January, was 5,496,328. While ore treated was lower than average mine grade for molybdenum, the low molybdenum content of the byproduct copper ores is clearly demonstrated. Other byproduct Arizona producers continued to be Phelps Dodge Corporation's Morenci mine, Miami Copper Company, and Bagdad Copper Company.

New Mexico producers—Molybdenum Corporation of America's high-grade Questa mine, and Kennecott Copper Corporation's Chino Mines Division (byproduct)—maintained production at the 1955 level.

Nevada's byproduct output was up slightly due to increased tonnage mined and milled by Kennecott Copper Corporation's Nevada Mines Division and Consolidated Coppermines Corporation.

Another copper byproduct molybdenite producer appears certain. It is Copper Cities Mining Company at Miami, Arizona, which has installed a pilot plant to test commercial aspects of molybdenite recovery from copper sulphide flotation concentrate.

A new unique but small source of molybdenum appears possible in the future. It is a byproduct of uranium milling. Laboratory work has proven successful for solvent extraction of molybdenum. The Gunnison Mining Company's new mill now building at Gunnison, Colorado will be equipped to recover molybdenum if and when solutions contain commercial amounts. It should be pointed out that molybdenum is a poison for RIP uranium circuits and its recovery in plants with those circuits does not appear attractive.

Chile maintained its position as No. 2 producer with 1956 output from copper ore at Kennecott's subsidiary—Braden Copper Company. Chile's output will be boosted in 1957 with copper byproduct starting from sulphide ores at the Chuquicamata mill of Chile Exploration Company, an Anaconda subsidiary.

Canada's sole molybdenum producer—Molybdenite Corporation of Canada Limited—increased production to 1,413,400 pounds of molybdenite from 165,026 tons ore milled. The 1955 figures were 1,288,777 pounds from 157,013 tons. At year's end milling rate was 530 daily tons from the firm's Quebec property. Ore reserves were maintained. A new roaster was placed in operation to convert molybdenum disulphide to molybdic oxide for use in Canada. The firm is also an important bismuth producer; 117,043 pounds in 1956.

In British Columbia an important mineralized body was indicated by Climax Molybdenum Company which drilled 1,714 feet of surface diamond drill hole to indicate several hundreds of thousands of tons of 0.90 percent MoS_2 bearing rock. The holes were drilled to test surface mineralization at depth. This work was done at the Boss Mountain property optioned in the fall of 1956 by Climax from a group of prospectors and business men. Further exploration is scheduled for 1957.

Argentina is scheduled to become a molybdenum producer with a new mill known as Minarbipa near completion in San Juan Province.

A copper-molybdenum deposit which produced a small amount of molybdenite during World War II was explored on Virgin Gorda Island in the British West Indies during the year.

Demand for molybdenum and molybdenum chemicals continued at a high rate throughout the year so that producers were hard pressed to fill orders. Exports were an important factor in this demand. Germany, France, United Kingdom, Sweden, Japan, Austria, Canada, Netherlands, and Italy were large importers of molybdenum from the United States.

Probably of greatest importance to the molybdenum industry was the growing use of a wide variety of molybdenum chemicals and research directed toward use of molybdenum alloys to meet the jet-age demand for metals with superior strengths at very high temperatures. The most important chemicals and their uses were: Molybdic oxide—ceramic frits, solid fertilizers; sodium molybdate—inorganic pigments, soluble fertilizers, catalysts, metal treating compounds, sodium phosphomolybdate—lakes and toners; lead molybdate—ceramic colors; barium molybdate—ceramic frits; ammonium molybdate—catalysts, analytical reagents; molybdenum power—lamps, electronic tubes, high temperature metals; and molybdenum disulphide—lubricant additive. Molybdate orange pigment use grew rapidly because of its light-fastness, great hiding power, and tinting strength. Idaho and Washington farmers increased their pea production by 50 percent by the addition of sodium molybdate to deficient soils. More than 105,000 acres will be treated in 1957 in the area for peas and other crops.

The Office of Naval Research, the Air Materiel Command, and the American Rocket Society have tested molybdenum and its alloys for jets, rockets and missiles. Temperatures up to 2,500° F. must be faced. At the present time molybdenum seems to be the best hope if coatings can be developed to prevent its oxidation. Ceramic and vapor-deposited molybdnumdisilicide coatings show promise of long time protection where mechanical impact, high stresses, or thermal shock is not involved. Four new arc-cast molybdenum alloys have been developed for service up to 2,600° F.

The prediction has been made for the last two years that the all-time 1943 production would be broken. It just might in 1957, but that is not too strong a possibility with the overproduction of copper. Climax output will be up but probably not enough to set a new mark.

NICKEL

DR. J. F. THOMPSON
Chairman of the Board, International Nickel Company of Canada, Limited, New York, New York

"The advent of atomic energy for power promises new and expanded markets for nickel products"

The year 1956 was one of the most eventful in the history of the nickel industry. Free world nickel production was at a new high. The year marked the beginning of the development in Manitoba Canada by International Nickel Company of Canada, Limited of the world's second largest nickel production operation which will result in a substantial increase in nickel supplies by 1960. It also saw the United States government arrange for the diversion to industry of substantially increased quantities of nickel originally scheduled for shipment to the government stockpile.

Production of nickel was approximately 450,000,000 pounds. This compared with the previous high output of about 427,000,000 pounds in 1955. Output by Canadian producers again accounted for about 80% of the free world's supply.

Deliveries of the metal in 1956 by International Nickel were approximately 285,000,000 pounds. Estimated 1956 deliveries by other principal Canadian producers are: Falconbridge Nickel Mines Limited, 43,000,000 pounds, Sherritt Gordon Mines Limited, 19,000,000 pounds. Other free world deliveries included 31,000,000 pounds from the United States government's plant at Nicaro, Cuba; 14,000,000 pounds from Hanna Nickel Smelting Company, Riddle, Oregon; 22,000,000 pounds produced by the French company, S. A. Le Nickel, from New Caledonian ores; and 26,000,000 pounds from all other sources, a major portion of which was refined in Japan from New Caledonian ores.

In order to deal with higher costs and facilitate maximum production, The International Nickel Company of Canada, Limited, increased its price of refined nickel by 9½ cents per pound effective December 6, 1956. This brought the export price of electrolytic refined nickel, from the company's Port Colborne, Ontario, refinery, to 74 cents per pound, from the level of 64½ cents per pound which had prevailed since November 24, 1954.

During the year the output of the nickel-containing stainless steels reached an all-time high. From the outset of the atomic energy program, nickel and nickel-containing alloys, because of their resistance to corrosion, have had an established role in every phase of nuclear development. The tempo of United Kingdom atomic energy developments increased as important industrial groups got into their stride with projects for the building of power stations following the opening of the first European plant at Calder Hall, England. The advent of atomic energy for power promises new and expanded markets for nickel products.

Plans announced in December 1956 by International Nickel for its new nickel-producing operation in the Mystery-Moak Lakes area of northern Manitoba and for progressive development of its facilities in the Sudbury district of Ontario constituted the greatest single expansion program in the history of the nickel industry. The Manitoba project alone will result in an investment in that Province of some $175,000,000 over the next three to four years.

International Nickel's own capital investment in Manitoba, as currently projected, will approximate $115,000,000, with a view to initiating the production of nickel by 1960. These expenditures include the cost of opening and development of two mines—to be known as Thompson mine and Moak mine—of constructing a concentrator, smelter, refinery, transportation facilities, and of providing certain townsite installations. The Manitoba Hydro-Electric Board will undertake construction, at an estimated cost of $32,000,000 to $38,000,000 of a large power plant to supply power for Inco's new facilities. In addition, it is estimated some $20,000,000 will be required for costs of homes and buildings at the Thompson townsite and about $5,000,000 for the construction of a 30-mile Canadian National Railways' spur line to link the new operations with the railway's Hudson Bay line.

The new Inco development in Manitoba is located about 400 air miles north of Winnipeg and will serve to open a new North American frontier. It climaxes 10 years of exploration by the company in Manitoba at a total cost of some $10,000,000. The Thompson town development is being planned to accommodate an initial expected population of some 8,000 persons, inclusive of the expected working force of approximately 2,000.

The project in Manitoba together with the progress under way at the Sudbury district operations will lift Inco's regular annual nickel-producing capacity to 385,000,000 pounds.

It is expected that the capacities of certain other nickel producers will also show an increase by 1960. Based on published statements free world nickel-producing capacity in 1960 may be of the following order: International Nickel, 385,000,000 pounds; Falconbridge Nickel Mines Limited, 55,000,000 pounds; Sherritt Gordon Mines Limited, 20,000,000 pounds; other Canadian producers, 15,000,000 pounds, or a total for Canada of 475,000,000 pounds; the United States Government's plant at Nicaro, Cuba, 50,000,000 pounds; Hanna Nickel Smelting Company, 17,000,000 pounds; New Caledonian ores processed in France and Japan, 65,000,000 pounds; other free world producers approximately 18,000,000 pounds.

PERLITE

R. S. FUNK
Administrative Secretary, Perlite Institute, New York, New York

"Again in 1956 approximately 50 percent of all plaster in the United States contained perlite"

The perlite industry continued its steady 10-year growth during 1956, although the rate of increase declined sharply during the last quarter of the year. Sales of crude perlite in 1956 are estimated to have set a new industry record of 307,000 short tons, with an estimated value of $2,490,000. This tonnage represents an increase of better than 7 percent over 1955 production.

Sales of processed (expanded) perlite also hit an all-time high estimated at 265,000 short tons with a cash value of $13,382,000. The difference between crude and processed tonnages is due to exports to Canada, process loss, tonnage in transit, and an increase in uses of crude perite without processing.

More than 70 percent of the expanded perlite was consumed by the plastering industry. As a consequence, the down-turn in new housing starts and delays in structural steel building construction as a result of the 1956 steel strike combined to retard the normally greater increases of perlite industry growth. It is estimated that again in 1956, approximately 50 percent of all plaster applied in the United States contained perlite aggregate.

Nearly all end uses of perlite showed moderate increases. The following end-use tonnages are estimated for 1956: plaster aggregate, 193,000; concrete aggregate, 33,000; oil well aggregates, 15,000; filter aids, 14,000; and miscellaneous uses, 10,000.

Miscellaneous uses for perlite include loose fill insulation, soil conditioner, fertilizer anti-caking agent, propagating beds for nursery stock, packaging material, insecticide and herbicide carrier, pipe insulation, paint filler and texturing agent, and various applications in metal foundries.

In assessing the industry's outlook for 1957, the Perlite Institute predicts a 12 percent increase in sales. This increase is expected to result from a continuing high level of construction

combined with the growing popularity of perlite aggregate for plaster and insulating concrete. Increases are also expected in the use of perlite in wallboards and roof insulation boards, acoustical tiles and plasters, and various horticultural uses.

Existing mining and processing facilities are believed to be adequate to supply the anticipated increased demand for perlite in 1957. Latest reports indicate that there are now 84 perlite processing plants operated by 72 companies in 30 states. Perlite mines are operated by 13 companies in six western states. New Mexico was the largest producer of crude in 1956 with 44 percent of the total. Colorado and Nevada furnished most of the balance with some output from Arizona, California, and Utah.

The Perlite Institute is currently sponsoring research at the agricultural experiment stations of five universities on the utilization of expanded perlite as a propagating material, soil conditioner, and for various agricultural chemicals and pesticides. Preliminary work indicates a large market potential for perlite in these fields.

As a result of Perlite Institute elections held in 1956, J. C. Kingsbury, vice president of the F. E. Schundler & Co., Inc. of Joliet, Illinois, was named president. Kirk E. Hazelton, assistant general manager of the Perlite Division of Great Lakes Carbon Corporation, Los Angeles, California is vice president of the Institute. General offices of the association continue to be located at 45 West 45th Street, New York 36, New York.

Growth of Perlite Industry
1947 Through 1956

Year	Crude Perlite Sold and Used by Crude Producers		Expanded Perlite Sold	
	Short Tons	Value	Short Tons	Value
1947[1]	10,450	$ 58,000	7,700	$ 271,000
1948[1]	22,100	134,000	18,600	742,000
1949[1]	71,100	510,000	52,200	2,385,000
1950[1]	101,536	649,162	86,962	4,471,383
1951[2]	153,502	858,099	133,175	7,243,298
1852[2]	164,845	873,054	154,503	7,997,731
1953[1]	198,751	1,439,658	174,461	8,894,735
1954[1]	219,703	1,762,100	195,499	10,278,745
1955[1]	286,157	2,281,632	246,343	12,585,297
1956[2]	307,000	2,490,000	265,000	13,382,000

1. Figures from U.S. Bureau of Mines, Mineral Industry Survey.
2. Estimate of Perlite Institute.

G. D. EMIGH
Director of Mining, Inorganic Chemicals Division, Monsanto Chemical Company, St. Louis, Missouri

PHOSPHATE

"The definite phosphate use trend is into blended and more concentrated fertilizers"

World production of high-grade phosphate ore and concentrates in 1956 is estimated at over 30,000,000 long tons as follows: United States, 14,450,000; Morocco, 5,600,000; Russia, 4,500,000; Tunisia, 2,100,000; Algeria, 650,000; Jordan, 150,000; Israel, 130,000; Pacific Islands (Oceania, Nauru, Christmas), 2,800,000; others 150,000. This is an increase of 2.0 percent over 1955 and a little lower than the general trend of growth over the past 10 years—about 7.0 percent per year.

United States production was about 14,450,000 tons—an 18 percent increase over 1955 and reflects recovery of the Florida production after the crippling 1955 strike. Average yearly increase for the past 10 years is about 7.0 percent. Exports were about 2,700,000 tons, an increase of over 400,000 tons from 1955, largely attributed to Japan and Spain.

Estimated production of the United States fields, with 1955 figures in parenthesis, follows: Florida 10,700,000 (8,747,000), West 2,000,000 (2,052,000), and Tennessee 1,750,000 (1,465,000). At year's end Florida stockpiles, depleted by the 1955 strike, regained over 500,000 tons and stood at well over 1,000,000 tons.

In general, a slow fertilizer market kept mined ore below hoped for levels over the year. Production of elemental phosphorus by electric furnaces had a moderate increase. Consumption of ore is estimated at 11,200,000 tons—about the same as the 11,120,000 tons used in 1955.

Outlook for the phosphate industry in the United States is one of moderate growth. About 85 percent of phosphate goes into fertilizer. The definite phosphate use trend is into blended and more concentrated fertilizers. The three fields—Florida, West, and Tennessee, will continue to show growth but Florida, with its higher grade ore, low costs, and advantageous freight location, will continue and may well increase its dominance for the indefinite future.

Outside the United States, world production will increase from existing operations and from new areas. The threat to production engendered by the political situation of North Africa seems to be lessening. Israel will continue its efforts to develop sizeable exports from its extensive deposits. The same it true of Trans-Jordan. New production is contemplated from Africa in Uganda, Union of South Africa, and French Senegal. Newly discovered deposits in Angola are being investigated. A new operation is under construction near Recife, Brazil. Another new operation has started in Venezuela. Newly discovered deposits in Southwest China and Mexico are under investigation.

Following are the highlights of new developments in the United States:

FLORIDA: American Agricultural Chemical Company installed silica flotation in its Boyette plant and announced plans for a third electric furnace. American Cyanamid Company is building its new Orange Park washer and flotation plant north of Lakeland. Its Saddle Creek operation will shut down in 1957. Coronet Phosphate Company, Division of Smith-Douglass Company, Inc., installed a new plant to produce potassium silicofluoride. International Minerals & Chemical Corporation shut down its Peace Valley operations, is doubling its sulfuric and phosphoric acid capacity at Bonnie plant, and increased Noralyn mine shipping facilities. Virginia-Carolina Chemical Corporation doubled capacity of its Phosmico plant. Kaiser Aluminum and Chemical Company is constructing a plant at Nichols to recover fluorine chemicals from nearby plants' waste products. Tampa Terminals Incorporation constructed vessel loading facilities at Tampa. Swift & Company added a unit to recover byproduct fluorine as potassium fluorsilicate.

TENNESSEE: Shea Chemical Company placed its second electric furnace in operation. International Minerals & Chemical Corporation completed new washing facilities at its Godwin plant. Victor Chemical Works announced plans for an added furnace at its Mt. Pleasant operation.

WEST: The J. R. Simplot Company's new Centennial mine, located on the Idaho-Montana boundary, began open pit operations and an initial 100,000 tons of high grade phosphate ore was shipped to Canada. This operation will be an important custom producer for many years to come. Montana Phosphate Products Company continued driving the low-level Brock Creek adit. San Francisco Chemical Company began construction of a wet beneficiation plant at its Leefe mine in Wyoming and did exploration work on the Humphreys property near Vernal, Utah, which it has under option. The Anaconda Company suspended underground operations at Conda, Idaho, and will obtain its ore by surface operations. Husky Oil Company of Cody, Wyoming acquired Federal phosphate leases in the Dry Valley area of southeastern Idaho. Central Farmers Fertilizer Company continued plans to build an electric furnace plant at Georgetown, Idaho, and started work on a 10-mile railroad to link the plant site to the main line.

N. C. WHITE
Vice President, Potash Division International Minerals & Chemical Corporation, Chicago, Illinois

POTASH

"Exploration has shown that Canadian potash reserves are richest known in the world"

The potash industry saw several important changes during 1956. Changes on the supply side included capacity increases by existing producers, addition of a new producer, start of construction by still another producer, and the equalizing of production capacity with demand. Changes on the demand side included new record total demand, an increase in seasonal fluctuations of demand, increased preference for potash in granular form, and a sharp increase in deliveries outside of North America and United States possessions.

Deliveries by United States producers during 1956 totaled 2,088,000 tons of K_2O equivalent, according to preliminary data released by the American Potash Institute. This is an increase of 5.3 percent over the corresponding figure for 1955. Deliveries in the continental United States by domestic producers of potash for agricultural use declined, however, by a fraction of one percent. This was offset by increases in deliveries for chemical use and by increases in exports to more than double the level of 1955.

Demand for potash in granular, or coarse, form continued to increase, and producers have attempted to meet this demand by making changes in and addition to their facilities for producing potash in fine particle sizes. Granular mixed fertilizers continue to grow in popularity, and this can be expected to increase requirements for granular potash. Whereas practically no granular fertilizer was consumed in 1950, 8.7 percent of all fertilizers consumed in the United States in 1954 and 1955 was in granular form.

Potash demand is closely tied to demand for mixed fertilizers. Total United States consumption of primary plant nutrients has increased steadily over a period of many years and amounted to 6,600,000 tons during the 1955-1956 fertilizer year. This consisted of 2,300,000 tons of nitrogen, 2,400,000 tons of available P_2O_5, and 1,900,000 tons of K_2O, for a ratio of about 1 : 1 : 0.8. Consumption of N and P_2O_5 in 1955-1956 were about 2 percent higher than in 1954-1955.

Potash prices continued essentially unchanged at the same level they have held since 1941. This achievement, in the face of steadily rising labor and equipment prices, is attributed to constant improvement in the efficiency of the men and machines engaged in potash production.

Activity in the Saskatchewan, Canada potash fields gained considerable momentum. Exploration has shown that Canadian potash reserves are richest known in the world. Potash Company of America, one of the largest of the Carlsbad, New Mexico producers, has been most aggressive in Canada. That company has made good progress in sinking its first shaft through strata which first had to be frozen artificially to make drilling possible. International Minerals & Chemical Corporation has selected a site and has formulated plans to commence sinking a shaft. Other Carlsbad producers and some foreign producers have been actively exploring the Canadian fields.

In New Mexico, Potash Company of America produces a major portion of its ore with continuous mining methods, made possible by addition of continuous mining machines and belt conveyors to replace both mainline and panel track haulage. P.C.A. also expanded facilities for chemical grade muriate. United States Potash Company, which during 1956 became a division of United States Borax & Chemical Corporation, completed a 20 percent increase in capacity at a cost of $3,000,000. Southwest Potash Company improved its feed preparation section and added new underground mining and hauling equipment which resulted in a substantial increase in plant capacity.

A new Carlsbad producer, National Potash Company, completed an $18,000,000 mine and refinery and started shipments early in 1957. This company is a joint venture of Freeport Sulphur Company and Pittsburgh Consolidation Coal Company. Another joint venture, Farm Chemical Resources Development Corporation, is scheduled to begin operating by late next year. This company is a combined effort of National Farmers Union, Kerr-McGee Oil Industries, Inc., and Phillips Petroleum Company.

With demand for potash currently satisfied, and with contemplated additions to productive capacity in excess of short and long range forecasts of growth in potash demand, it is evident that competition among the producers will be keen. But the industry will continue to be basically sound, because demand for its product is firmly rooted in the necessity for high farm productivity.

STANLEY H. DAYTON
Associate Editor

RARE AND MINOR METALS

"Highlights of Bismuth, Cadmium, Columbium, Tantalum, Platinum, Selenium, and Zirconium"

Bismuth metal consumption dropped six percent to an estimated 1,459,000 pounds last year according to preliminary reports by the U. S. Bureau of Mines. The pharmaceutical industry consumed about 29 percent of the total, and the remaining 71 percent was used in fabricating alloys. Imports of bismuth during 1956 totaled 922,800 pounds, the highest on record, and 55 percent above the 595,600 pounds recorded in 1955. The United Kingdom supplied 43 percent, Peru 35, Mexico 13, and Canada, Yugoslavia and Netherlands 9 percent of the total imports. Complete data was not available, but approximately 170,100 pounds of bismuth was exported during the last half of 1956 compared with 58,000 pounds in the like period during 1955.

Cadmium metal production reached an all-time high during 1956 with a total output of 10,431,000 pounds being recorded. This represented a six percent increase over 1955. Total shipments of cadmium metal were five percent below those of 1955, and apparent 1956 consumption of approximately 11,211,000 pounds was seven percent below the comparable figure for 1955.

Columbium-tantalum plant capacity for production of columbium and tantalum metals and ferroalloys mounted sharply during 1956, but world columbium-tantalum mineral production dropped. The United States output of concentrates, however, remained at about the same level as 1955. Exploration and development of North American deposits containing columbium-tantalum increased last year. The largest producing operation in the United States was at Bear Valley, Idaho, where Porter Brothers Corporation was successfully dredging and concentrating euxenite sands contained in placer deposits. Porter Brothers has a contract with GSA covering the purchase of 1,050,000 pounds of columbium-tantalum oxides over a five-year term. The Idaho euxenite concentrate was treated at a new plant in St. Louis, Missouri to produce columbium-tantalum, uranium, thorium, and rare-earth compounds.

Kennecott Copper Corporation exercised its option on a pyrochlore deposit at Oka, Quebec, formerly held by Molybdenum Corporation of America. At Jos and Odegi, Nigeria, Kennecott is modernizing operations for mining and concentrating columbium-tantalum-bearing alluvial deposits.

Fansteel Metallurgical Corporation is now producing columbium-tantalum metal at its North Chicago plant, and has plans for a new facility at Muskogee, Oklahoma. Molybdenum Corporation of America started producing ferrocolumbium and ferrocolumbium-tantalum late in 1956.

The Platinum Group metals continued to enjoy brisk demand during 1956 and indications are that consumption was slightly

above the high level recorded in 1955. A leading factor in the high rate of consumption is the use of platinum in the petroleum refining industry as a catalyst in the production of high-octane gasoline. Platinum consumption for jewelry purposes continued to decline. Total world production of platinum group metals was estimated at 927,000 ounces in 1956, with about 80 percent originating from the Union of South Africa and Canada.

Selenium, which has been in critically short supply since about 1950, was available in increasing amounts in 1956, and toward the end of the year the supply situation eased considerably. The U. S. Bureau of Mines estimated 1956 production of selenium at 1,107,176 pounds, up sharply from the previous year's 840,000 pounds. Companies reporting selenium production were American Smelting & Refining Company, Kawecki Chemical Company, Kennecott Copper Corporation, American Metal Company, and International Smelting & Refining Company. Selenium and germanium continued to be widely employed in the electrical and electronics field as semiconductor materials. Selenium has found extensive applications in rectifiers, and germanium is used in transistors and diodes.

Zirconium, little more than a curiosity 10 years ago, was very much in the news in 1956. Domestic output of zircon concentrate was expected to increase during 1956 due to expansion of Humphreys Gold Corporation's zircon recovery facilities in Florida. Also two new organizations entered the field—Marine Minerals Company, Aiken, South Carolina, and Heavy Minerals Company, Panama City, Florida.

But the big interest was in the production of hafnium-free zirconium metal. The Atomic Energy Commission contracted with three companies for the production of 2,200,000 pounds of metal per year. This was in addition to contractual commitments already in force with The Carborundum Company, which pioneered commercial production of reactor-grade zirconium sponge, calling for delivery of 200,000 pounds of sponge metal per year. Contracts negotiated in 1956 for zirconium production included: National Distillers Products Corporation which will produce 1,000,000 pounds of sponge per year from a plant under construction at Ashtabula, Ohio; National Research Corporation which is building a plant at Pensacola, Florida with a 700,000-pound yearly capacity; and The Carborundum Metals Company which is expected to complete work on a new 500,000-pound plant at Parkersburg, West Virginia by mid-1957. In addition, the Atomic Energy Commission, during 1956, authorized Wah Chang Corporation to operate the U. S. Bureau of Mines zirconium plant at Albany, Oregon and produce 300,000 pounds of sponge per year for two years.

R. D. Leisk
Consulting Mining Engineer, Spokane, Washington

SILVER

"Silver production relatively static, demand and consumption rising, long-term outlook good"

Production of silver in the United States in 1956 is estimated at 37,200,000 ounces and in the Western Hemisphere at 145,000,000 ounces. In each instance the 1956 production was approximately equal to the average annual production over the five-year period 1952 through 1956. World production of 230,000,000 ounces in 1956 was about four percent higher than the five-year average.

World consumption of silver in the arts and industries in 1956 increased to an estimated 204,000,000 ounces, about 20 percent higher than the five-year average. Coinage, exclusive of United States coinage which is supplied from Treasury Department inventories, consumed 25,000,000 ounces. Total world consumption exclusive of United States coinage was therefore practically in balance with production in 1956 and this was reflected in a remarkably stable market throughout the entire year. The New York price in 1956 ranged between a low of 90¢ and a high of 91.625¢ per troy ounce. Both the high and low were reached in the first two months of the year and the year end New York quotation was 91.375¢ which corresponds to the price of 91¢ at which users may obtain silver from United States Mint at San Francisco, California. Some 11,500,000 ounces of the 1956 United States production were sold directly to industry at prices slightly higher than the Treasury buying price of 90.5¢, and in the last quarter of the year users purchased 3,700,000 ounces from the Treasury.

United States Treasury stocks of free silver were reported at 87,400,000 ounces as of December 31, 1956. This may be compared with a low of 13,600,000 ounces reported December 31, 1954. The increase is due to receipts of lend lease silver from foreign governments amounting to 109,900,000 ounces during 1955 and 1956. Without the return of lend lease silver the Treasury stocks of free silver would have been exhausted and recent price patterns would have been different. Free silver is silver bullion held by the Treasury which is not pledged for redemption of silver certificates. It consists of silver purchased by the Treasury prior to 1942 under authority of the Silver Purchase Act of 1933, plus silver retained as seigniorage from newly mined domestic silver tendered to the Treasury by producers. During World War II some 410,500,000 ounces were lend leased to allied and friendly governments with a provision for return of the silver in kind five years after the end of hostilities. Return of lend lease silver commenced about the end of 1954 and the balance due on the Treasury books stood at 300,600,000 ounces on December 31, 1956. This has since been reduced to 286,500,000 ounces by December 1956 shipments credited to 1957. The due date for return of lend lease silver has been extended two years from April 1957 in the case of 127,000,000 ounces of the remaining balance. As the return of all of the lend lease silver by 1959 seems assured it is therefore apparent that the Treasury on December 31, 1956 had a potential reserve of free silver of 87,400,000 plus 300,600,000 or 388,000,000 ounces. This is a matter of considerable importance in relation to its probable effect on silver prices during the next several years.

In March 1955 bill (S.1427) providing for repeal of all silver purchase legislation was introduced by a group of New England senators together with Senator Douglas of Illinois. Hearings began in July 1955 before a sub-committee of the Banking and Currency and were continued into 1956. The bill was opposed by the silver producing industry and by western senators. On June 5, 1956 a motion to report the bill favorably was lost by a vote of six to one. This in effect prevented any action on the bill by the 84th Congress.

The defeat of (S.1427) is to some extent only a mixed blessing to silver producers squeezed by rising costs against a price ceiling created by a paradoxical provision in the Act of July 31, 1946. This act reduced seigniorage to 30 percent by directing the Treasury to purchase newly mined domestic silver by paying for 70 percent of such silver at the coinage value of $1.2929 per ounce thus assuring the domestic producer a minimum price of 90.5¢ per ounce. The same act, however, authorized the Treasury to sell silver from its free silver stocks to qualified users at 91¢ per ounce.

Prior to the Act of July 31, 1946 the Treasury had no authority to sell its stocks of free silver below the statutory coinage value of $1.2929 per ounce and it becomes obvious that under the present inflationary economy, a restoration of that status is badly needed by the silver producers.

Failing such relief, producers can hope for no increase in price above 91¢ until the potential Treasury stock of 388,000,000 ounces has been exhausted. Additions to the free silver stock come through seigniorage on domestic production. Subtractions come through use of the silver for subsidiary coinage and by sales to silver users at 91¢. Requirements for subsidiary coinage are substantial. During the last five years the amount of silver in circulation has increased by 184,200,000 ounces. If it is assumed that seigniorage added to the free silver stocks each year will be offset by Treasury sales to industry in like amount, an estimate can be made of the time it might take to liquidate the reserve of free silver through withdrawals for subsidiary coinage. Subsidiary coinage in circulation as of December 31, 1956 contained 967,700,000 ounces of silver. Taking the annual requirement for new coinage as four percent of the amount in circulation at the first of each year indicates a period of liquidation of nearly nine years. This would be a long time for a producer operating in an inflationary economy to wait for relief from an artificial price ceiling.

Summing up—the rate of silver production is relatively static—industrial consumption and demand are rising—the long-term price outlook is good—the short-term price outlook is poor unless the Treasury's authority to sell silver at less than coinage value is rescinded.

J. C. CARRINGTON
Vice President, Freeport Sulphur Company, New York, New York

SULPHUR

"In spite of the greater demand for sulphur little change occurred in the use pattern"

Production and consumption of sulphur in the United States during 1956 attained new highs for the third consecutive year. This healthy state of the industry is attributable to the versatility of sulphur and to the continued high level of the economy.

Total production of sulphur from all sources increased to an estimated 7,875,000 long tons, or 825,000 tons more than in 1955.

The largest part of the new production came from the salt dome deposits of Louisiana and Texas. These deposits, which are mined by the Frasch hot water process, produced an estimated 6,450,000 tons compared with 5,750,000 tons in 1955. Of the balance of the supply, 500,000 tons represented sulphur recovered from gases, 425,000 tons sulphur contained in pyrites, and 500,000 tons sulphur in various forms from other sources.

Consumption of sulphur in the United States was estimated at 5,900,000 tons compared with 5,650,000 tons in the previous year, and exports were expected to equal the 1,600,000 tons shipped in 1955.

There were 13 Frasch process mines operating during the greater part of the year. Texas Gulf Sulphur Company, the largest producer, operated three in Texas; Freeport Sulphur Company, four in Louisiana and one in Texas; Jefferson Lake Sulphur Company, two in Texas and one in Louisiana; and Duval Sulphur and Potash Company and Standard Sulphur Company one each in Texas. In November, Freeport closed its small Nash mine in Texas.

Two new Frasch process mines were under development in 1956 and plans were announced to mine an additional new deposit. Those being developed are the Lake Pelto property of Freeport and the Fannett dome of Texas Gulf. The former is located in the shallow waters of the Louisiana tidelands about 60 miles southwest of New Orleans, while the latter, on dry land, is near Beaumont, Texas.

The new deposit, known as Grand Isle—Block 18, lies off the coast of Louisiana beneath 45 feet of water six miles from the nearest land. The deposit, which is considered to be one of the most important sulphur discoveries of recent years, was discovered by Humble Oil and Refining Company. Upon approval by the Department of the Interior of the assignment of leases, Freeport will install and operate productive facilities. The Grand Isle project will be the first completely offshore sulphur mining operation ever undertaken.

The outlook for sulphur in 1957 is one of continuing high consumption. Domestic requirements should be large and demand from abroad appears to be increasing as the trend toward Frasch sulphur continues. The United States sulphur industry is well prepared to meet this demand. Increasing productive facilities coupled with reassuring above-ground stockpiles of Frasch sulphur put the industry in a strong position for the future.

C. I. BRADFORD
President and General Manager, Rec-Cru Titanium, Inc., Midland, Pennsylvania

TITANIUM

"Suddenly titanium was no longer an 'experimental' metal . . . Military needs will at least double"

The year 1956 can be summarized as the year in which the aircraft industry gave titanium a solid vote of confidence as a standard engineering material for production components. This vote of confidence resulted in a three-fold increase in demand for titanium mill products in 1956 over 1955. Final shipment figures should clear the 5,000-mark. The same trend appears certain to continue in 1957. A minimum demand of 10,000 tons of mill product is the estimate, and the titanium industry is believed to be able to respond to this challenge by achieving a reasonable supply and demand balance before the end of 1957.

This acceptance of titanium's tonnage status in military and civilian aircraft comes just five years after titanium's first flight test—in an F-84 airplane in 1951. During succeeding years, production of mill products increased at a rapid rate, but with most of metal being used for experimental or prototype work.

At the end of 1955, the record showed a total production for that year of about 2,000 tons of sheets, bars, billets, and other forms of wrought titanium. The best industry and government forecasts for 1956 indicated a demand for about 3,000 or, at the most, 3,500 tons. But, suddenly, titanium no longer was an "experimental" metal. Several types of airplanes using significant quantities of titanium began to come off the lines in large numbers, and jet engines with titanium compressors suddenly became quite popular, giving excellent accounts of themselves in service.

The result was startling. Instead of the quite respectable 50 percent increase over 1955, demand jumped by a factor of over three. By expanding its capacity under forced draft, the industry turned out about 5,000 tons of mill products. For 1957, the present best guesses indicate a military need for at least double the 1956 figure. Expectations are that these goals will be met.

Behind this optimism is the assurance of adequate raw materials for 1957; however, if the present rate of increase in demand continues, additional sponge facilities will be required. The situation as it is expected to exist by mid to late 1957 is:

Sponge Producer	*Annual Capacity (tons)*
Cramet, Inc.	6,000
Dow Chemical Company	1,800
E. I. DuPont de Nemours & Company, Inc.	7,200
National Distillers, Inc.	5,000
Titanium Metals Corporation of America	9,000
Union Carbide and Carbon Corporation	7,500
Total capacity	36,500

Another development in the sponge picture was the joint announcement by Allied Chemical and Dye Corporation and Kennecott Copper Corporation to form a new company for the production of titanium. An initial investment of $40,000,000 is planned, and production of sponge and billets is scheduled to begin late in 1958.

The four major producers of titanium mill products have all announced expansion of melting facilities to meet increased demand during 1957. These producers are Rem-Cru Titanium, Inc., jointly owned by Remington Arms Company, Inc. and the Crucible Steel Company of America; Titanium Metals Corporation of America; Mallory-Sharon Titanium Corporation; and Republic Steel Corporation. In view of the industry's increased melting capacity, it is expected, barring presently unforeseen additional requirements, that there will be considerable improvement in delivery schedules during 1957.

During the year, many new commercial uses for titanium were developed by working with designers of chemical process, paper manufacturing, marine, metal-finishing, and electronic equipment. Just as the performance of titanium in prototype aircraft has led to its acceptance in the aviation industry, so it is believed that the performance of these prototype installations in non-defense applications will soon multiply the number of industries which consider titanium a basic material of construc-

TIN

R. W. MacIntosh
Manager, Tin Research, Institute, Inc., Columbus, Ohio

"Consumption of tin throughout the world in 1956 rose to an all time high of 157,000 tons"

The tin mining industry in 1956 had a satisfying year with production and consumption in better balance than they have been for the last few years. A moderate rise in demand and a reasonable tin price furnished the real incentive to the major producers to maintain their output.

Malaya, as the principal producer, spent considerable effort in the reconstruction of dredges for deeper digging, and smelters increased their efficiency in the methods of treating lower grade ores. A record postwar output was the result. Thailand, Belgian Congo, and Nigeria maintained their production average in 1956. Indonesia and Bolivia, on the basis of 1956 figures, need to produce more tin in order to adjust their adverse trade balances. The slight decrease in total world tin metal production was in part due to the curtailed production of the Texas City, Texas smelter.

Consumption of tin throughout the world in 1956 rose to an all time high of 157,000 tons, the highest total since 1941. This is quite remarkable in view of the steel strike in the United States. Consumption rose in all the main consuming countries —about six percent in the United States and significantly in Canada, West Germany, Japan, and France. Consumption of tin in tinplate continues to rise steadily each year and the other established uses—notably solder, tin alloys, and tin chemicals made gains in 1956. No spectacular rise in consumption was reported in the newer uses for tin, although slight gains have resulted from the development of tin alloy coatings, and from an increased demand for pewter.

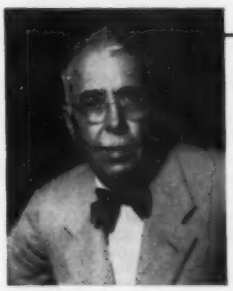
Events in the Suez towards the last part of the year temporarily caused tin prices to rise but as the turbulent conditions moderated, the price of tin regained some of its stability.

The outlook for the tin mining industry as we enter 1957 gives causes for optimism. For the first time in many years, the tin industry has an organization, the International Tin Buffer Stock Pool, having as an ultimate aim the creation of market stability and a price level reasonable to both producers and consumers. Increased industrial activity all over the world, coupled with the steel industries' plans for expansion of tinplate production, will quite likely cause a further gain in consumption during 1957. On the production side, the security position in Malaya has improved and a big prospecting program, backed by the government, has been planned. The Malayan Department of Mines has completed the building of a research institute at Ipok where investigations on mining and mineral recovery methods will be instigated. The Texas City smelter was purchasd by the Wah Chang Corporation of New York, but future production of tin, tin alloys, and tungsten will be on a much reduced scale. Since most of the production of the Texas City smelter has gone into the United States stockpile, which has now reached its goal, additional ore supplies will now be available to the industrial world and this should improve the supply picture.

World Tin Mine Production In Long Tons By Countries In 1954, 1955, and 1956

Country	*1954*	*1955*	*1956*
Malaya	60,691	61,245	62,295
Indonesia	35,861	33,368	31,874
Bolivia	28,824	27,920	26,849
Belgian Congo	15,084	15,208	14,533
Thailand	9,776	10,970	11,723
Nigeria	7,927	8,159	9,054
Others	—	20,130	18,172
TOTAL WORLD		177,000	174,500

TUNGSTEN



W. L. Long
President, The Tungsten Institute and Tungsten Mining Corporation, Warrenton, North Carolina

"Results of test program will greatly influence tungsten consumption in future aircraft"

One of the most significant national developments relating to the domestic tungsten mining industry in 1956 was the lifting, by the Department of Defense, of all restrictions on the use of tungsten in the manufacture of aircraft gas turbine engines. The Instruction of October 15 (including, in addition to tungsten: cobalt, nickel, chromium, columbium, and molyndenum) was issued by Frank D. Newbury, Assistant Secretary of Defense.

This order opened the door to the development of new tungsten containing alloys for use in the jet age to which aviation, both military and commercial, is obviously committed. The spectacular non-stop "round the world" in 45-1/3 hours made by five B-52s is an indication of progress in jet aircraft, and its powerful influence on our national security and economic needs. Eight turbine engines, developing over 10,000 horsepower of thrust each, are in each B-52.

During 1956 production and consumption of domestically mined tungsten were closely related to the expiration of the government's stockpile program that expired in June and the newer legislation that made it possible for the industry to operate its mines and sell its production under a limitation of 5,000 short ton units per month for any one mine. The government purchase price fixed by the new legislation, under the jurisdiction of the Department of Interior, was $55.00 per short ton unit compared to $63.00 under the original program.

At the close of 1956, the U. S. Bureau of Mines estimated a total domestic production for 1956 of 13,500,000 pounds of which 7,935,000 was produced prior to July 1. Consumption for 1956 was 8,900,000 pounds.

More than $1,000,000,000 worth of commercial jets are now on order for delivery to the progressive airlines and just recently the last of the propeller driven fighter planes, the F-51, has been retired. The "Mustang" that first made its appearance in World War II and was our fighter strength in the Korean conflict has been replaced entirely by jet powered fighters. The goal now is to make our jet military planes the best in the world, a feat that seems to be possible only by development and adoption of a tungsten base alloy. This is now within the realm of scientific achievement, in the opinion of R. H. Thielemann, of Stanford Research Institute, who is director of the research program on high temperature alloys for The Tungsten Institute.

This research program, sponsored by The Institute, was begun in late 1955, but has already brought about new thinking on the part of jet engine manufacturers who foresee through results already obtained by research and development of high temperature alloys a probable solution to their most pressing materials problem. This is improvement of heat-resistant materials to the extent that they will crack the heat barrier. The heart of the jet engine is the turbine, and in that area the major materials problem exists. Work is now underway through The Tungsten Institute research program that may produce an alloy system that has oxidation resistance at high temperatures equal to that of platinum. Another materials problem, caused by the thermal thicket, the intense heat cre-

ated by friction induced by speed, is that metals now in use creep and lose strength. One of the newest, light-weight, fighter jets has thin, straight wings the edges of which are only 0.016 of an inch thick, so keen—in fact—that a felt covering is used to protect ground crewmen when the plane is not flying. With its high modulus of elasticity of 55,000,000 pounds per square inch, tungsten sheet metal parts would have ample stiffness in the highly stressed applications, such as those created by the thermal thicket. This is another angle our research program has under consideration.

Under The Tungsten Institute research program a new alloy, WI-52, has been developed. It is more heat resistant than any previously used in blades and vanes of jet aircraft. A complete set of blades and vanes of WI-52 is now in the hands of a leading aircraft engine manufacturer for further evaluation. We believe that results of test program will greatly influence tungsten use in future aircraft. Development of a 2,000° F. tungsten base turbine blade alloy, having 50 percent or more of tungsten, will be invaluable to the future of the jet age.

Another interesting development in uses of tungsten is the "throw away" trend with regard to tungsten carbide tool inserts in automotive cutting operations. A recent survey indicates that within a relatively few years throw-away insert tools will average 40 percent of all single point operations used in metal working. This will largely displace use of ceramic tools as ceramic inserts cannot be used in this application. Also the use of throw-away detachable bits grows in the mining industry. The throw-away method probably will become extremely popular and will increase the use of tungsten carbide very significantly.

URANIUM

"The only major uranium market, other than in weapons is in the power reactor field"

J. T. Sherman
Assistant Director for Domestic Procurement, Division of Raw Materials, United States Atomic Energy Commission

January 1, 1957 marked the 10th anniversary of the establishment of the United States Atomic Energy Commission. The past year has proven to be as significant in the field of uranium production as any of the first nine in terms of exploration, milling, and government program.

One of the important developments has been the declassification of uranium production figures after June 30, 1955 which permits detailed discussion of ore reserves, milling capacity, and projected developments. For the domestic field the following figures were released by the AEC on December 13, 1956:

Uranium concentrate production, 1956	6,000 tons[1]
Uranium concentrate production rate, December 1956	8,000 tons per year
Daily milling capacity, operating mills, December 1956	8,960 tons per day
Daily milling capacity, new mills under contract, December 1956	4,025 tons per day
Estimated ore reserves, average grade 0.25% U_3O_8	60,000,000 tons
Ore production in 1956	3,000,000[1]
Estimated mill investment, operating mills, December 1956	$50,000,000
Estimated mill investment, mills listed for construction, December 1956	$35,000,000

1. December estimated.

Since this release a contract has been negotiated with the AEC by Homestake-New Mexico Partners involving the construction of a 750-ton-per-day mill in the Grants, New Mexico area.

Exploration: Measured, indicated, and inferred domestic uranium ore reserves reached a total of 60,000,000 tons by the end of 1956. The marked increase during the year resulted mainly from the spectacular discoveries in the relatively new Ambrosia Lake area in northwestern New Mexico. Multimillion ton ore bodies were drilled out by a number of private companies resulting in a current reserve approaching 30,000,000 tons. Intensive drilling should add substantially to this figure during 1957. Grades and thickness of the ore have been gratifying, averaging around 0.25 percent U_3O_8 over some 10 feet with some ore bodies having grades approaching 0.50 percent U_3O_8 and thicknesses as great as 90 feet. The Jackpile mine, approximately 35 miles southeast of the Ambrosia Lake discoveries, is now estimated to contain at least 15,000,000 tons of 0.16 percent U_3O_8 ore. Another area that has had a substantial increase in reserves is the Gas Hills-Crooks Gap field in central Wyoming. Other areas showing noteworthy developments were Monument Valley, northern Arizona; the Spokane, Washington area; Lakeview, Oregon area; Pryor and Big Horn Mountains in Montana and Wyoming; Gunnison, Colorado area; and the Texas Gulf Coastal area.

Discoveries in other countries have also added to the Free World resources. Important discoveries are reported at a number of points in France, chiefly of the vein type. In Australia, the largest mill in that country is in the design stage and when completed will treat ores from the Mary Kathleen property in the Mt. Isa-Cloncurry area. Canadian reserves were appreciably increased during the year and are now officially estimated at 225,000,000 tons averaging around 0.10 percent U_3O_8. Since the Canadian government announced on May 25, 1956 that no further contracts for concentrates are at present contemplated, exploration and drilling have been sharply curtailed. South African exploration has been largely confined to testing known gold-bearing reefs for uranium content. Reserves are very large but low in grade, ranging in U_3O_8 content from a high of 0.06 percent at Randfontein to a low of 0.011 percent at Loraine with an average of approximately 0.027 percent.

Milling: At the present time the following uranium mills are in operation in this country:

Name	*Location*	*Capacity Tons Ore Per Day*
The Anaconda Company	Bluewater, New Mexico	3,000
Atomic Energy Commission	Monticello, Utah	600
Climax Uranium Company	Grand Junction, Colorado	350
Kerr McGee Oil Industries, Inc.	Shiprock, New Mexico	500
Mines Development, Inc.	Edgemont, South Dakota	300
Rare Metals Corporation	Tuba City, Arizona	250
Union Carbide Nuclear Co.	Uravan, Colorado	850
Union Carbide Nuclear Co.	Rifle, Colorado	280
Uranium Reduction Co.	Moab, Utah	1,500
Vanadium Corp. of America	Durango, Colorado	430
Vanadium Corp. of America	Naturita, Colorado	350
Vitro Uranium Company	Salt Lake City, Utah	550
	Total	8,960

During 1956, nine new contracts were negotiated with the AEC involving the construction of eight new mills and a major expansion of an existing mill, the Rifle, Colorado mill of Union Carbide Nuclear Company.

The list includes the following:

Name	*Location*	*Rated Capacity Tons Ore Per Day*
Atomic Fuel Extraction Co.	Bedrock, Colorado	200
Dawn Mining Company	Ford, Washington	400
Gunnison Mining Company	Gunnison, Colorado	200
Homestake-New Mexico Partners	Grants, New Mexico	750
Lost Creek Oil & Uranium Co.	Split Rock, Wyoming	400
Lucky Mc Uranium Corp.	Fremont County, Wyoming	750
Trace Elements Corp.	Maybell, Colorado	300
Texas Zinc Minerals Co.	Mexican Hat, Utah	775
Union Carbide Nuclear Co.	Rifle, Colorado	1,000*
	Total	4,775

*Including ore fed to concentrating plants.

In addition to those listed above, some half a dozen new mills, which will add materially to domestic milling capacity, are in the planning stage.

The use of new processes and techniques as well as the trend to larger mills has resulted in lower milling costs.

In South Africa, 16 of the 17 projected mills are now in production which have a capacity to treat in excess of 50,000 tons per day. The construction of these large installations has taken place in the surprisingly short space of six years. In addition to the completion of the uranium recovery mills, this development involved the construction of six sulphuric acid plants having a combined capacity of 1,390 tons of sulphuric acid per

day and a major expansion of a number of other chemical plants in the Union.

In Canada, 1956 marked a year of rapid mine development and mill construction. At the beginning of 1956 there were four uranium mills in operation and two new mills were completed during the year. In 1957, it is expected that 17 mills will be in production and another should be operating by early 1958. The combined capacity will be approximately 40,000 tons per day.

In Australia, two mills are in production and a third in the design stage is scheduled for completion in 1958.

Process Development: All of the new mills completed in 1956 utilize an acid leach for dissolving the uranium values. Either column ion exchange or resin-in-pulp are used in these new plants but in two of the older domestic mills solvent extraction has been recently introduced. It should soon be possible to evaluate this method in comparison with other methods.

Government Actions: The establishment of a domestic procurement program for the March 31, 1962-December 31, 1966 period was the most important action announced by the AEC in 1956 in the Raw Materials field. This program provides a market for U_3O_8 concentrates produced from domestic ores by domestic mills subject to a limitation, at the Commission's option, of 500 tons of U_3O_8 from any one mining property or mining operation. The price is established at $8.00 per pound of U_3O_8 contained in normal mill concentrates. This assures a substantial market for uranium over the next ten years and allows the mining companies to make long-range plans for exploration, mining and milling. The objective is to assure the Government of an adequate supply of uranium over the ten-year period and to have the uranium industry in a position to supply requirements for industrial use beyond 1966.

Future Markets: While Government action has assured domestic producers of a substantial market for uranium concentrates over the next ten years, the uranium industry, with its large reserves, is looking ahead to the post-1966 period. The only major uranium market, other than in weapons, is in the power reactor field. When power from nuclear reactors has been demonstrated to be commercially attractive we can look forward to a rapid increase in uranium requirements for reactor use. In this connection it is interesting to note that in the United States alone the number of nuclear reactors built, building or planned as of December 31, 1956 has reached a total of 231. While it is true that a great majority of these are not to be used for commercial or military power production the vast amount of time and money being expended in the reactor field would seem to indicate a good possibility for a substantial uranium market 10 years hence.

In a recent talk before the Colorado Mining Association, Dr. Willard F. Libby, Commissioner of the AEC, indicated that the United States requirements for the power program 10 to 20 years from now may be from 20,000 to 30,000 tons of U_3O_8 per year with possibly an equal amount required by the rest of the Free World.

Blair Burwell
President, Minerals Engineering Company, Grand Junction, Colorado

VANADIUM

"There are a number of reasons for the increase in vanadium usage . . . foremost are new uses"

Both production and consumption of vanadium in 1956 increased over 1955, continuing the upward trend of production and use which has now continued for the past three years. The United States produced about 90 percent of the world supply in 1956, reaching an estimated output of 15,000,000, pounds of V_2O_5. This compares with 13,104,800 pounds in 1955. The principal source of uranium in the United States is the Colorado Plateau where it is produced as a co-product of uranium. A minor output is obtained from phosphate refining in Montana.

Up to mid-1954 considerable vanadium was produced in excess of consumption and stockpiled by the United States government or purchased by the United States Atomic Energy Commission as a related part of uranium contracts. By mid-1954 increases in consumption of vanadium absorbed this production surplus and, with the exception of 350,000 pounds in 1956, all vanadium produced in the Colorado Plateau was consumed in the United States or exported abroad.

There are a number of reasons for the increase in vanadium usage . . . foremost are new uses. One new use is as an alloying element in fabricated titanium metal where 4½ percent of vanadium is now used in about 70 percent of the output. Substantial increases have occurred in the consumption of vanadium metal and pure ammonia salt in the form of ammonium metavanadate.

Another increase in vanadium markets has been caused by the increasing of vanadium in engineering steel where vanadium has traditionally been a useful alloy in producing high strength and fatigue resisting steel with a broad tolerance to variations in composition and heat treatment. A new high speed steel with a vanadium content up to 4½ percent is showing increased performance over the momax type of high speed steel.

World production outside of the United States has declined with the suspension of operations in Peru. Output in South West Africa continued on a fairly even note. Production of vanadium from titaniferous iron increased with the starting of the Otanmaki Company's plant in Finland in the first half of 1956. This plant is rated at an annual output of 1,330,000 pounds of V_2O_5 in concentrates which are produced by a high

Production, Consumption, and Exports of Vanadium in Pounds of Contained V_2O_5 in the United States from 1946 through 1956, and World Production from 1946 through 1956

	1946	*1947*	*1948*	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956 Estimate based on 9 Months' Data*
UNITED STATES[1]											
Production of Concentrate	2,631,800	5,446,000	3,898,000	3,595,500	6,500,000	7,958,400	7,728,000	8,950,800	11,255,000	13,104,000	15,000,000
Consumption[2]	No data	No data	No data	No data	No data	No data	No data	No data	No data	6,052,000	7,046,000
Exports from U.S.A.	—	—	—	—	—	—	—	—	239,000	3,581,000	4,143,000
WORLD PRODUCTION[1]											
North America	2,631,800	5,466,000	3,898,000	3,595,500	6,500,300	7,958,400	7,728,600	8,950,800	11,255,000	13,104,000	15,000,000
South America	1,287,000	1,735,000	2,030,000	1,817,000	1,739,000	1,788,000	1,742,000	1,269,000	721,860	310,000	75,000
Africa-Rhodesia	277,000	222,000	683,000	608,000	0	345,000	168,000	0	0	0	No data
Africa-Southwest Africa	1,686,000	1,105,000	733,000	640,000	1,156,000	2,073,000	2,446,000	2,119,376	2,250,000	2,247,000	No data

1. Pounds of contained V_2O_5. 2. Consumption in the United States is partial only due to unavailability of information. Consumption in 1955 and 1956 estimated to be approximately 4,000,000 greater than Government figures due to captive production and consumption not reported.

temperature roast (1,200° C.) with sodium sulphate using concentrated magnetite-illmenite ore containing about 0.80 percent V_2O_5.

A portion of the output of Finland is reported going to Russia. Some production of vanadium from Swedish titaniferous ore recovered in slags was reported, but the details of quantity are not available and probably are not important.

European consumption of vanadium increased substantially in 1956 with the supply principally derived from imports from the United States.

Prices for vanadium oxide (86 percent minimum) in the United States averaged $1.25 per pound of V_2O_5 content compared with 97¢ paid for government stockpile purchases. Prices in Europe were higher due to duties and freight.

Increased production of vanadium is forecast for 1957 with additional plant capacity in the Colorado Plateau scheduled for completion during the year. A plant for production of vanadium from titaniferous magnetites is under construction at Witbank, Union of South Africa. It is also indicated that vanadium consumption will continue its upward trend in 1957.

ZINC

H. L. Young
Vice President, American Zinc, Lead & Smelting Company, St. Louis, Missouri

"New discoveries indicate Tennessee will become one of the largest zinc producing areas"

The most important single factor in the overall zinc picture during 1956 was the United States government. Had it not been for the domestic stockpile, coupled with the barter program, the record high production of slab zinc by domestic smelters might well have resulted in a price decline. However, the substantial government support of buying to the tune of 157,000 tons of slab zinc placed a floor under the price of prime western metal at 13.50¢ per pound for the entire year.

The stability in the price of slab zinc existing in the industry for the past year and a half has been most noteworthy and commendable. Many informed people among producers and consumers feel that this trend in the face of much wider fluctuations in competitive metals will result in expanded uses of zinc in many industries in the future.

While production of slab zinc in 1956 was slightly larger than in 1955, domestic consumption fell from 1,081,468 to 977,460 tons, a decrease of 104,008 tons, or approximately 10 percent. The steel strike in July and the curtailed automobile production were largely responsible for this decline. In spite of these unfavorable factors, 1956 was the third largest consumption year in history. Stocks of slab zinc in the hands of consumers at the end of the year were lower than at the end of 1955 and not considered excessive.

Production of galvanized sheets set an all-time record in 1956 of slightly under 3,000,000 tons and the consumption of zinc per automobile unit in the 1957 models increased to approximately 65 pounds per car.

Consumption of slab zinc in Europe also declined during 1956. Recent figures show that consumption in the United Kingdom dropped from 346,000 to 315,000 tons, a decline of approximately 10 percent and compares to a similar drop in consumption in the United States. It should also be noted, however, that stocks of zinc in the United Kingdom at the end of 1956 were lower than at the end of 1955. The barter stockpiling program of the United States government has been responsible for taking excess zinc production off the European market in the same manner in which the regular stockpiling program has helped to remove excess domestic production from the United States market.

Mine production: United States mine production increased in 1956 from 503,000 tons to approximately 550,000 tons. This mine production might have been still greater had it not been for several short strikes in Idaho and at New Jersey Zinc Company's Sterling mine. Increases in production occurred in New Mexico, Colorado, and the Illinois-Wisconsin field. New major producing properties were brought into the east Tennessee area and additional properties will come into production during the next two years. The proven and indicated reserves in east Tennessee areas are very substantial, new discoveries indicate Tennessee will become one of the largest zinc producing areas.

Smelter production: Slab zinc production set a new high in 1956 of 1,062,954 tons as compared to the previous 1955 high of 1,031,018 tons. Increased capacities at Josephtown, Pennsylvania; Corpus Christi, Texas; and Kellogg, Idaho entered the picture in 1956 with some additional capacity to be added in 1957. Domestic smelter output will probably continue to rise as long as demand for zinc can justify full production. Here again continued stockpile purchases by the government will be a governing factor.

Imports: Zinc of foreign origin came into the United States in 1956 in even greater amounts than 1955. Imports in ores and concentrates are estimated at about 530,000 tons of zinc content as against 491,000 tons in 1955. Imports of zinc metal of all grades reached a high of approximately 230,000 tons as against 193,700 tons in 1955. The barter stockpile program of the government undoubtedly was a factor in the large imports of slab zinc.

Foreign production: Several major discoveries of zinc have been developed outside of the continental United States and as these discoveries are brought into production they will certainly have an effect on all markets. The new fields in New Brunswick, in Canada, and large potential developments in Brazil, are worthy of note, even though it might be several years before any of this production becomes a reality. It also has been rumored that major developments have taken place behind the Iron Curtain in Bulgaria and Poland, as well as in Russia. For the first time in many years Russian zinc was offered in the Free European market. This may be an indication that future exports of zinc from behind the Iron Curtain will be forthcoming.

Forecast: Considering the detrimental factors, such as the steel strike and curtailed automobile production, which occurred in 1956, the year as a whole can be rated as a very good one. Actually, the shipments of slab zinc to domestic consumers were the second highest in the history of the industry, and based on market conditions at the end of the year, 1957 should be even better than 1956. These factors include:

(1) Forecasts of increased automobile production, coupled with increased usage of zinc per automobile.
(2) The continued expansion of continuous galvanizing facilities and the high rate of sales of galvanized products which should be maintained in 1957.
(3) The competitive position of zinc from a price standpoint as compared to some other non-ferrous metals, particularly aluminum, should tend to increase the use of zinc in new products, as well as in replacements of other higher priced non-ferrous metal products in 1957.
(4) The research and development programs of the individual producers, combined with the industry-wide research programs of the American Zinc Institute, are beginning to show encouraging results. These programs should help to develop new uses of the product and improved production and design in manufactured products where zinc is already being used. The total result is a feeling of optimism toward the expanded uses of zinc in 1957 and in the future.

Significant Zinc Industry Figures in Metric Tons for 1954, 1955, and 1956

	1954	1955	1956
U.S. Mine production	466,842	503,800	537,600
U.S. Imports (ore & concentrates)	454,027	491,187	530,000[1]
U.S. Slab zinc production	868,242	1,031,018	1,062,954
U.S. Imports slab zinc	156,858	195,695	230,000[1]
U.S. Slab zinc consumption	876,130	1,081,648	977,460
U.S. Slab zinc exports	27,927	19,497	9,027
U.S. Slab zinc domestic deliveries	787,922	1,007,619	869,260
U.S. Slab zinc deliveries to government	108,957	87,200	157,014
U.S. Smelter shipments, total	924,808	1,114,316	1,035,301
Free world mine production	1,897,000	1,982,244	2,080,000
Total indicated slab zinc for foreign consumers	1,362,667	1,387,676	1,370,000
Foreign smelter production	1,422,525	1,503,361	1,550,000

1. Estimated.

A LOOK AT

U. S. Mining in 1956

Alaska

● Decline in Prospecting But Exploration Expenditures Were Greater Last Year

Alaska's mineral production for 1956, amounting to $24,919,000, was almost equal to that of 1955. Decreased gold production was offset by increases in coal, mercury, and chromite. Sand and gravel displaced gold at the top of the list in total value. Gold holds second place, followed by coal, platinum, mercury, and chromite, in order of importance.

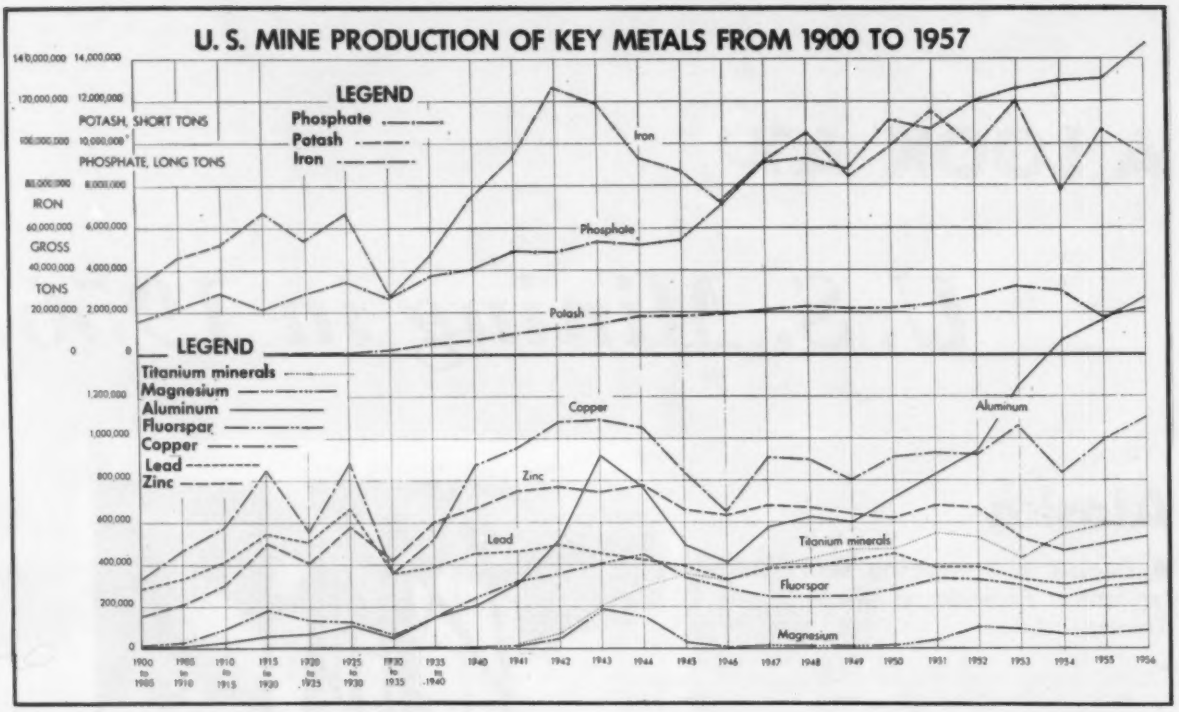
Lode gold mining is practically nonexistent in Alaska, and more placer operators were forced to shut down due to general economic conditions. The major portion of gold production was by United States Smelting, Refining and Mining Company from its Fairbanks and Nome dredging operations. Goodnews Bay Mining Company operated as usual in the Bristol Bay area and continues to be the major United States platinum producer. Kenai Chrome Company increased the tonnage and grade of its chromite shipments to reach a new high for Alaska. DeCoursey Mountain Mining Company also set a production record for mercury.

Prospecting activities and claim staking reached a peak in 1955 and dropped off in 1956. A total of 1,513 claims were staked in 1956 as compared with 1,807 in 1955. In contrast with this, however, expenditures by established mining companies and local groups in exploration activities increased considerably in 1956 over the 1955 level.

Interest in uranium dropped off in 1956 in keeping with the stateside trend. Actual mining and shipping of proven ore bodies has been delayed pending improvement in marketing conditions and availability of milling facilities at or near the West Coast. Prospecting was concentrated in the search for copper, iron, nickel, and mercury deposits, although gold, molybdenum, lead, and zinc received their share of interest.

Base metal activities throughout Alaska by areas were:

SOUTHEASTERN—Climax Molybdenum Company and Union Carbide Nuclear Company conducted diamond drilling on two uranium prospects on Prince of Wales Island. Quebec Metallurgical Industries and Columbia Iron Mining Com-



pany constructed a small concentrator on the Klukwan iron deposit and made a 1,400-ton concentrate shipment for furnace tests. Columbia also continued prospecting and development work on magnetic iron deposits at Union Bay and on Duke Island. Admiralty-Alaska Gold Mining Company accelerated its exploration program at the Mertie Lode nickel-copper deposit at Funter Bay.

SOUTH CENTRAL—Kenai Chrome Company continued mining and shipping metallurgical grade chromite from the Star 4 claim on Red Mountain, and began construction on a mill at tidewater for beneficiation of lower grade ores. Moneta Porcupine Mines developed the Red Top mercury deposit near Dillingham, which may become a new producer in 1957. Northern Pyrites completed the drilling of a pyrite deposit at Horseshoe Bay, Latouche Island. The beach placers in the eastern portion of the Gulf of Alaska were prospected for heavy metals and considerable ground was staked.

YUKON BASIN—Earl Pilgrim made two shipments of high-grade antimony ore from the Stampede mine. DeCoursey Mountain Mining Company put a new mercury plant in operation early in 1956 and was operating steadily at the close of the year. This company and other groups conducted exploration on other mercury deposits in the Kuskokwim Valley.

NORTHWESTERN—Rhinehart Berg continued exploration of the promising Ruby Creek copper deposit near Shungnak. Neal Foster located and explored a lead deposit near Deering. There was no activity on the tin reserves of this area.

Arizona

● Greatest Year For Copper; Both Pima and San Manuel Brought into Production

Arizona's copper production in 1956 set an all-time record of 502,400 tons of metal valued at $421,011,200. The marked gain in value—24 percent over 1955 and 89 percent over 1954—resulted from the combined factors of higher prices and greater tonnage. Arizona has held first place among the copper-producing states each year since 1910. This year, the lead over Utah, the second largest producer, was increased to 102 percent.

Metallic and nonmetallic minerals produced in Arizona during 1956 were valued at $471,104,000, a 25 percent increase over 1955.

Major credit for Arizona's greater production of copper goes to the San Manuel Copper Corporation, the state's newest large-scale producer. San Manuel began smelting copper concentrate January 8, 1956, and on January 23, 1956 the mine was in production with the first stope undercut completed. Inability to secure sufficient skilled miners prevented the company from attaining capacity production of 30,000 tons of ore daily by the end of the year, and the target date was advanced to the first half of 1957.

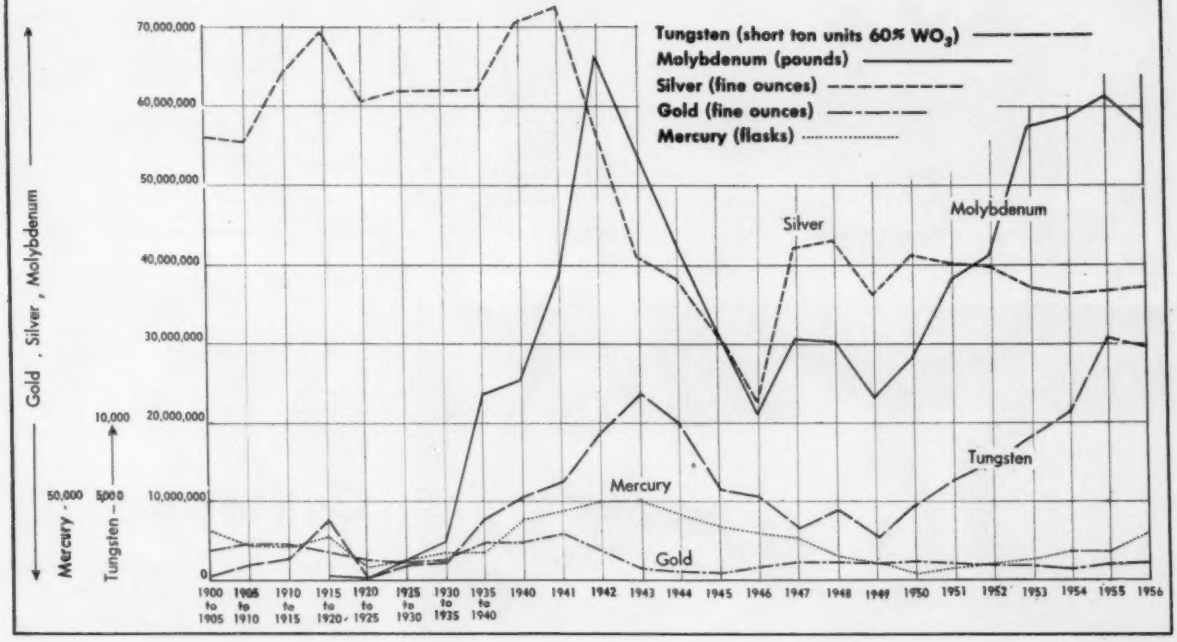
Another factor in the over-all increase in copper output was the 35 percent advance in production from the Lavender open-pit of Phelps Dodge Corporation, following the completion in 1955 of the precipitation plant for recovering copper from leached, lower grade ore. The Mo-

Mineral Production of Alaska from 1953 through 1956

Mineral	1953 Quantity	1953 Value	1954 Quantity	1954 Value	1955 Quantity	1955 Value	1956* Quantity	1956* Value
Chromite[1]			2,953	208,257	7,082	$ 625,340	7,200	$ 704,000
Coal, bituminous[1]	861,471	8,451,542	666,618	6,442,414	639,696	5,759,000	697,730	6,330,000
Gold[2]	253,783	8,882,405	248,511	8,697,885	249,294	8,725,000	204,300	7,150,500
Lead[1]	‖	2,240	—	—	—	—	—	—
Mercury[3]	40	7,721	1,046	276,552	(5)	(5)	3,414	837,140
Sand and gravel[1]	7,689,014	5,079,681	6,639,638	6,301,939	9,793,214	8,242,344	9,100,000	8,300,000
Silver[2]	35,387	32,027	33,697	30,497	33,693	30,394	26,700	24,165
Stone[1]	47,086	169,711	283,734	465,423	265,740	289,589	50,000	22,000
Tin[4]	49	105,917	199	409,953	86	182,484	—	—
Tungsten (60% concentrates)	(6)	(5)	—	—	—	—	—	—
Undistributed[6]		1,520,782		1,576,380	—	1,557,307	—	1,551,500
TOTAL		$24,252,000		$24,412,000		$25,412,000		$24,919,000

* Estimated. 1. Short tons. 2. Fine ounces. 3. Flasks. 4. Long tons. 5. Value included with undistributed. 6. Includes platinum, gem stones, and other minerals whose value must be concealed to avoid disclosing individual company incomes.

U. S. MINE PRODUCTION OF KEY METALS FROM 1900 TO 1957



renci Branch of Phelps Dodge continued to be the state's largest producer.

The Ray Mines Division, Kennecott Copper Corporation, set a new record in 1956, producing approximately 56,500 tons of copper from ore which averaged 0.91 percent. Plans for a $40,000,000 expansion and improvement program were announced, the major items being erection of a smelter at Hayden and extension of the open-pit mine at Ray. The company's $5,000,000 leach-precipitation-flotation plant at Hayden was scheduled for completion early in 1957. These new facilities are expected to result in a 20,000-ton increase in the division's annual copper output by 1958.

Inspiration Consolidated Copper Company practically completed the $6,500,000 project begun in 1955 to convert its metallurgical plants to the "dual process" whereby the ore is first leached to recover oxide copper, then transferred to the flotation plant for sulphide recovery. The new plant was placed on a production basis January 9, 1957. It is expected to increase copper recovery.

Pima Mining Company started milling ore at its new 3,000-ton flotation plant in December 1956, thereby giving the state another large open-pit copper mine. Conversion of Pima's underground mine to an open pit called for removal of overburden to a depth of 200 feet—more than 4,500,000 cubic yards—and construction of the 3,000-ton concentrator.

The Chirstmas mine near Winkelman, under development by Inspiration, gives promise of becoming the state's next major producer. Inspiration's expenditures in the Christmas area, since acquiring the property in 1954, already amount to $2,500,000. The company reports indicated reserves of 10,000,000 tons of 2 percent grade copper ore in the O'Carroll Bed, with the possibility of additional tonnage of lower grade ore. Present planning calls for a 2,500-ton concentrator, designed for expansion as needed, and production in the second half of 1959.

At the Bagdad Copper Corporation, Bagdad, a pilot plant for the production of electrolytic copper (with sulphuric acid as a by-product) went into operation during the spring of 1956. Bagdad estimates that more than one-third of its total copper reserve is in oxide copper, not recoverable by present milling methods.

Production of gold and silver, both primarily by-products of copper mining, increased 14 percent and 10 percent, respectively, in 1956. Gold output amounted to 145,500 ounces, valued at $5,092,500. Silver recovery was 5,112,000 ounces, valued at $4,626,618.

Molybdenum production—all recovered as a by-product from copper ores—was up 62 percent over 1955 and totaled 2,420,000 pounds, valued at $2,444,200. Two new properties were added to the list of producers: San Manuel, which made its first shipment in July, and the Silver Bell mine of American Smelting and Refining Company, which installed a molybdenum circuit and made its first shipment in September.

Arizona operators shipped 38,900 long tons of manganese concentrate (35 percent or more Mn) in 1956, valued at $3,644,800. All manganese was marketed under the government's carlot program.

Higher prices for lead and zinc stimulated production of both metals. Lead output totaled 11,900 tons, valued at $3,808,000, a 21 percent advance over 1955. Zinc output was 25,150, valued at $6,790,500, compared with 22,684 tons valued at $5,580,264 in 1955. Among lead-zinc producers, the greatest increase was recorded by the Iron King mine of Shattuck Denn Mining Corporation. The San Xavier mine in the Twin Buttes District also reported a gain in production.

The major development in Arizona's uranium industry was the opening of the 250-ton mill at Tuba City by Rare Metals Corporation in July. Ore for the plant is supplied primarily from the Cameron area by Rare Metals and by Utco Uranium

Arizona Production of Molybdenum, Gold, Silver, Copper, Lead, and Zinc. Dollar Value of Base Metals From 1941 through 1956

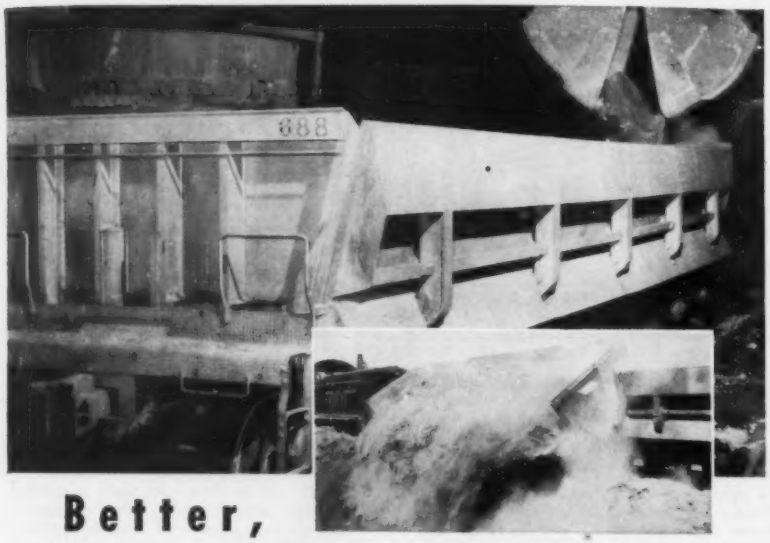
Year	*Molybdenum Pounds*	*Gold Ounces*	*Silver Ounces*	*Copper Tons*	*Lead Tons*	*Zinc Tons*	*Dollar Value*
1941	NA	315,392	7,498,260	326,317	15,638	16,493	$ 97,638,310
1942	"	253,651	7,064,467	393,387	14,772	18,522	114,525,600
1943	"	171,810	5,713,889	403,181	13,727	19,677	121,212,902
1944	"	112,162	4,394,039	358,303	16,707	29,077	113,094,806
1945	"	77,223	3,558,216	287,203	22,867	40,226	95,963,006
1946	"	79,024	3,268,765	289,223	23,930	43,665	114,986,254
1947	"	95,860	4,569,084	366,218	28,566	54,644	182,752,537
1948	"	109,487	4,837,740	375,121	29,899	54,478	196,207,948
1949	"	108,993	4,970,736	359,021	33,568	70,658	177,894,134
1950	"	118,313	5,325,441	403,301	26,383	60,480	201,033,694
1951	1,172,740	116,093	5,120,985	415,870	17,394	52,999	235,289,045
1952	2,022,832	112,355	4,701,330	395,719	16,520	47,143	220,686,278
1953	1,446,557	112,824	4,351,429	393,525	7,092	19,613	242,572,489
1954	1,538,088	114,809	4,298,811	377,927	8,385	21,461	237,818,952
1955	1,497,000	127,616	4,634,179	454,105	9,817	22,684	325,928,786
1956[1]	2,420,000	145,000	5,112,000	502,400	11,900	25,150	441,328,818

1. Estimated by U.S. Bureau of Mines. NA—Not available.

California Production of Metals and Minerals. Dollar Value is Given For Base Metal Output From 1941 Through 1956

Year	Iron Ore Long Tons	Chromite Tons	Mercury Flasks	Tungsten Tons (60% WO3)	Boron Minerals Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	60,293	13,419	25,714	2,603	301,282	1,408,793	2,154,188	3,943	3,464	440	$52,231,066
1942	95,107	44,873	29,906	3,483	226,723	847,997	1,450,440	1,058	5,151	613	31,771,607
1943	794,440	62,495	33,812	3,871	256,633	148,328	609,075	8,762	5,820	1,856	9,176,616
1944	845,260	34,715	28,052	3,027	277,586	117,373	778,936	12,721	5,682	8,455	10,933,495
1945	280,573	9,607	21,199	1,073	325,935	147,938	986,798	6,473	7,224	9,923	11,152,081
1946	340,491	4,107[2]	17,782	1,262	430,689	356,824	1,342,651	4,240	9,923	6,877	18,788,664
1947	530,434	948	17,165	394	501,935	431,415	1,597,442	2,407	10,080	5,415	21,769,620
1948	153,684	274	11,188	1,767	450,932	421,473	724,771	481	9,110	5,325	20,294,093
1949	536,525	433	4,493	952	467,592	417,231	783,880	649	10,318	7,209	20,616,562
1950	831,445	404	3,850	2,025	647,735	412,118	1,071,917	696	15,831	7,551	22,081,859
1951	1,198,847	6,302	4,282	3,007	862,797	339,732	1,145,219	921	13,967	9,602	21,700,575
1952	1,516,373	14,713	7,241	2,980	583,828	258,176	1,099,658	800	11,199	9,419	17,151,792
1953	1,697,652	26,512	9,290	2,130	715,228	234,591	1,036,072	382	8,664	5,358	12,870,230
1954	1,270,292	30,661	11,262	3,089	790,449	237,886	309,575	362	2,671	1,415	9,857,265
1955	1,776,536	22,105	9,875	4,383	924,496	251,737	954,181	613	8,265	6,836	14,276,301
1956[1]	2,375,000	25,000	8,500	3,900	1,000,000[3]	194,800	966,000	800	10,000	8,100	13,749,000

1. Estimated by U.S. Bureau of Mines. 2. California and Oregon production combined in 1946. 3. Dollar value of boron mineral production estimated at $29,000,000.



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SINCE 1915—PIONEERS IN HAULAGE EQUIPMENT

Corporation. In January 1957, the AEC announced that the Globe ore-buying station would cease operations on June 30, 1957, because the tonnage received and reserves developed in the area had been smaller than expected. The plant has been in operation since July 1955. Arizona's reserves of uranium ore were set at 2,600,000 tons by the AEC last November.

California

● New Borax Facilities Close To Completion; Lead and Zinc Show Good Gain Over 1955

The value of California's mineral production registered another substantial gain last year, but softness was apparent in gold, mercury, and tungsten. Output of chromite, copper, iron ore, lead, manganese ore and concentrates, silver, and zinc showed increases over 1955 figures. Most notable was the gain registered by iron ore with a 30 percent increase from 1,776,536 long tons in 1955 to an estimated 2,375,000 long tons in 1956. Manganese production almost doubled; lead and zinc output were up 21 and 4 percent, respectively. Total value of the state's metal output in 1956 was set at $53,966,500, compared with the $51,413,431 registered the year before.

Borax production is expected to total 1,000,000 tons, valued at $29,000,000, for the first time in history, according to preliminary Bureau of Mines estimates. Pacific Coast Borax Division of United States Borax & Chemical Corporation is rushing an open pit into production. Isbell Construction Company is stripping the deposit, located midway between Mojave and Barstow, California, at a rate of 25,000 tons per day. When mining commences (about July 1957) the company will use 3-yard shovels, dump trucks, and vertical auger drills. New refining facilities are being constructed next to the open pit by Southwestern Engineering Company and Ford J. Twaits. Total expenditure by Pacific Coast Borax will approximate $20,000,000. When the new facilities are completed, it is expected that the underground operations of Pacific Coast Borax will be closed down.

Kaiser Steel Company increased ore production at the Eagle Mountain mine, Riverside County, during 1956, and averaged 10,000 tons of ore and 20,000 tons of waste per day. The installation of a second beneficiation plant was underway, and at least 50 percent of the production was a product of the upgrading plant.

Big Michigan Tractor Shovel loads out 4,400,000 lbs. of open hearth slag per day

Clearing ground for the Lake Calumet Harbor near Chicago, Contractor C. J. Wilson is removing 700,000 yds. of open hearth slag dumped by neighboring steel mills. This material weighs approximately 4000 lbs. per yd., is extremely abrasive and tough to dig. With one 2¼-yd. Michigan Tractor Shovel, Wilson is loading out 110 trucks per day—10 yd. six-wheelers. That's 4,400,000 lbs. of slag per day!

Does work of 1½-yd. shovel

Wilson says that he couldn't beat this production with a 1½-yd. shovel. Calculating the hourly cost (initial cost, depreciation, maintenance, etc.), of a dragline versus the Michigan, the Michigan does the job at least 40% cheaper. With the abrasive ground conditions which prevail on the job, Wilson is naturally enthusiastic about being able to do the job on rubber-tires.

"Can't beat the front-end"

Since the first Michigan Tractor Shovel was introduced early in 1954, more and more contractors have found that this machine will handle jobs which they'd never even attempted with rubber tired equipment. Veteran crawler-loader owners, like C. J. Wilson agree that you can't beat the front-end on this machine. It will out-dig any make or type of Tractor Shovel, bar none.

Balanced power and weight

The best way to understand the Michigan's operational advantages is to watch one *ease up to a pile of tough material and come out with a heaping bucket load.* You don't have to ram the pile to get penetration. The Michigan's combination of bucket action, weight and power enables the machine to *dig its way* into the pile. 133 diesel horsepower flows smoothly through the 3-to-1 torque converter, 4-speed power-shift transmission and heavy duty drive axles right out to four big tires. Planetary gears in the wheel hub eliminate axle breakage . . . they take 70% of the torque load off the shafts.

Clean design of the Michigan bucket mechanism provides good dumping clearance. Note the heaping bucket load: 40-degree low-level tip-back guarantees heaping loads of any material which can be heaped.

Standard on all models

Clark torque converter, power-shift transmission and planetary wheel drive axles are standard equipment on every model in the Michigan Tractor Shovel line—1-yd., 1⅜-yd. and 2¼-yd. capacity. In each capacity, a Michigan Tractor Shovel will give you more useable digging power and traction than you've ever seen on this type of machine—faster production, lower cost per yard. For proof, ask your Michigan distributor to demonstrate—*you name the job.*

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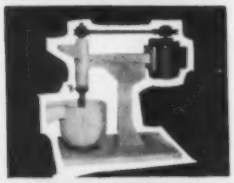

LABORATORY FLOTATION MACHINE

The aerating mechanism is carefully proportioned to represent a scale-down of the commercial size flotation machine. Flotation data can be directly interpolated into plant requirement estimation for BOOTH flotation machines. This machine is very easy to operate and clean, thus minimizing the testing engineer's time. All wear parts are corrosion and abrasive resistant.

RUBBER COVERED AND SOLID RUBBER IMPELLERS

Five sizes of rubber covered cast iron impellers, and seven sizes of solid rubber impellers are available to meet the requirements of almost any agitation service where corrosion and abrasion are a problem. Both types can also be furnished in neoprene.

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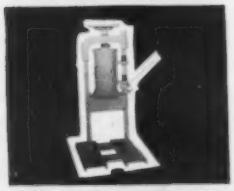
The BOOTH Company maintains a fully equipped ore testing laboratory and a competent staff of metallurgical, chemical, and mechanical engineers with experience in almost any type of ore to aid in solving your mineral beneficiation or chemical engineering problem.

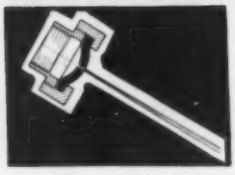
LABORATORY ROLLS AND INFRA-RED SAMPLE DRYER

The compact, versatile, combination laboratory rolls for ball mills and bottles featuring quick speed change is available with rubber covered rollers from 25 to 48 inches long. Fast, thorough drying of metallurgical samples is yours with a BOOTH Infra-red Sample Dryer.



PRESSURE SAMPLE FILTER AND LABORATORY BALL MILL

The BOOTH Sample Filter and Laboratory Ball Mill are both unexcelled for speed and convenience. Barrel and yoke of filter close from open position quickly and easily and line up automatically. Sealing is accomplished by rotating a single handwheel. Ball mill cover is centered automatically and sealed by a single nut.



The only spray ever developed for flotation plants. Can effect a reduction in plant launder spray water consumption of 40% to 60%. Durable rubber diaphragm automatically ejects any foreign material without flow interruption.

"40 Years of Ore Treatment"

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Lead and zinc production continued to increase in 1956, and, as expected, the silver output followed lead in its improved position. Principal factor behind the increase was a higher output from The Anaconda Company's Darwin and Shoshone group of mines in Inyo County. Gold production, down 23 percent, fell to the lowest point since 1945. The closure of the Empire Star Mines in Grass Valley, where strike conditions prevailed during the last half of the year, had a pronounced influence on total production. The Idaho Maryland Mines Company, formerly a major producer, disposed of its mine surface plant at Grass Valley and reportedly centered its interest in tungsten in the same vicinity. Most of California's gold (75 percent) continues to originate from placer sources. Natomas Company and Yuba Consolidated Gold Fields produced some platinum from dredging operations on the American and Yuba rivers.

Copper output showed a small gain. Exploration work by Phelps Dodge Corporation, in an agreement with the Shasta Copper and Uranium, Inc., is being carried out in the Flat Creek district of Shasta County. The possibility of reopening the Balakalala, Greenhorn, Shasta King, and Sugar Loaf mines exists. Pyrite production was completely converted from underground workings to open pitting at the Iron Mountain property of Mountain Copper Company of California in Shasta County. The changeover accounted for a decrease in output, most of which goes for acid manufacture.

Production of mercury dipped 14 percent last year due to the lower average price (about $260 per 76-pound flask) prevailing in 1956. Exploration and development projects continue at a high pace. About 40 percent of the Defense Minerals Exploration Administration projects in the state were for mercury ore. Principal producers of mercury were: New Idria Mining & Chemical Company, Abbott Sulfur Bank Mines, La Libertad Mine, the Guadalupe and New Almaden mines, and the Buckman Mines.

Tungsten production declined to 3,900 tons of concentrate last year due to the completion of the original purchase program and the delayed decision to extend stockpile acquisitions. Chromite producers were active throughout the year, and it is felt that the carlot program initiated in 1956 was a factor. At least six chromite mills were operating in Northern California and three in the Southern Coast Ranges.

Central

● Zinc Production Gains in Illinois; Kentucky Fluorspar Producers Are Active

It is estimated that approximately 325,000 tons of fluorspar were shipped during 1956 by domestic producers, and 60 percent of the production originated in the Illinois-Kentucky area. Illinois output of fluorspar showed a slight increase last year—from 166,337 tons in 1955 to an estimated 170,000 tons in 1956. In Kentucky, fluorspar production nearly doubled during 1956 to reach 17,000 tons. Approximately 100,000 feet of exploratory drilling for fluorspar was conducted in the Illinois area by the major mining companies, according to a report by

which can be heaped.

Benton Harbor 14, Michigan

J. Blecheisen, president of Rosiclare Lead and Fluorspar Mining Company.

During 1956, it was reported that Minerva Oil Company purchased the properties of Victory Fluorspar Mining Company northeast of Cave-in-Rock, Illinois, and is modifying the workings for Diesel-truck haulage and Diesel loading. In Kentucky, Pennsylvania Salt Manufacturing Company opened its new Dyers Hill shaft and is now actively mining and milling fluorspar for its own use. Aluminum Company of America did some exploratory work on its mine holdings in Kentucky, and the Rosiclare Lead and Fluorspar Mining Company took steps to re-open its Pigmy mine in Crittenden County, Kentucky. Hicks Creek Fluorspar Mining Company opened a heavy media plant in Illinois in 1955, and reportedly expects to open a flotation plant in the spring of 1957.

A slight decline in the production of lead in Illinois to a 4,125-ton total was more than offset by a 10 percent gain in zinc output during 1956. Zinc production for the state registered 23,985 tons last year. A minor amount of silver was also recovered from refining operations on Illinois ores. Mines in the JoDaviess County (northern Illinois district) accounted for 61 percent and 44 percent of the lead produced in Illinois. The remainder of the zinc and over half the lead were produced as a by-product or co-product of fluorspar mining in Hardin County (southern Illinois district).

Mining operations in the southeast Missouri lead belt in 1956 showed little change from 1955. St. Joseph Lead Company operated five mills; Mine La Motte Corporation and the National Lead Company operated mills in Madison County, Missouri. Total ore delivered to the seven mills in 1956 was slightly under the 1955 figure. All major companies maintained active, exploratory drilling programs in 1956, and Mine La Motte Corporation started a circular shaft, similar to the Indian Creek Shaft of St. Joseph Lead Company. The shaft was spotted in the Mine La Motte tract one mile east of the mill.

Operation of the National Lead Company cobalt-nickel refinery, at Fredericktown, Missouri, initially started in 1955, was continued with production increasing in 1956 as improvements were made in the chemical process and equipment.

Colorado

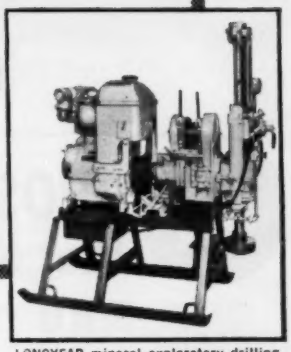
● More Lead-Zinc Producers Operated Last Year; Climax Molybdenum Ore Output Grows

Aided by generally higher metal prices, the value of Colorado's mineral production increased in 1956 over 1955. Vanadium, gold, lead, and zinc output increased, while molybdenum, tungsten, and silver declined.

Emperius Mining Company's new mill at Creede was the only major new base metal mill placed in operation during the year. However, Resurrection Mining Company rebuilt its differential flotation mill at Leadville to treat ore mined from the Resurrection Mining Company (Newmont)-American Smelting and Refining Company joint venture operations through the Yak Tunnel, Irene, Hellena, and Julia Fisk shafts.

Idarado Mining Company consolidated its milling at its rebuilt Pandora mill

Why Getman Brothers Picked AIRCOOLED DEUTZ DIESELS to power its ore carrier



LONGYEAR mineral exploratory drilling machine with Deutz Aircooled Diesel Engine Unit uses Longyear Diamond Core Drill #24. Longyear selected Deutz for its compactness of design, fuel efficiency and excellent service and parts facilities.

The Scoot Crete Ore Carrier serves in underground and open-pit mining, carrying loads up to 3500 lbs. and climbing 25° grades. A fast-starting Diesel, with no over-heating problems, high fuel efficiency and minimum down time was called for. The answer was a DEUTZ AIRCOOLED DIESEL.

In picking a DEUTZ AIRCOOLED DIESEL, Getman Brothers joins Longyear, Atlas-Copco and a long list of other American and foreign manufacturers in specifying the world's outstanding aircooled diesel for their equipment. Only DEUTZ has these outstanding features:

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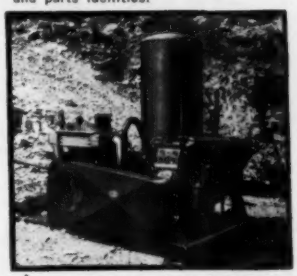
- Complete service and parts facilities right where you need them

Manufacturers, dealers and operators are invited to send for a detailed illustrated catalog featuring performance data and specifications.



Mine installation at Rock Springs, Arizona, uses ATLAS COPCO Compressor CT-6 with Deutz–6 cylinder A 6L/514 engine to assure top running efficiency in all temperatures. The semi-portable compressor provides 320 C.F.M.

PARTIAL SPECIFICATIONS TABLE

Model	Cont. BHP/Cont. RPM
F 1 L 612	10/2000
F 2 L 612	20/2000
F 3 L 612	30/2000
F 4 L 612	40/2000
F 6 L 612	60/2000
A/F 2 L 514	30/1600
A/F 3 L 514	45/1600
A 4 L 514	60/1800
A 6 L 514/614	90/1800
A 8 L 614	120/1800
A 12 L 614	180/1800

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Colorado Production of Molybdenum, Tungsten, Gold, Silver, Copper, Lead, and Zinc. Dollar Value of Base Metals From 1941 Through 1956

Year	Molybdenum Pounds	Tungsten 60% WO_3 Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	27,751,273	646	380,029	7,301,697	6,748	12,574	15,722	$23,877,597
1942	41,852,136	380	268,627	3,096,211	1,102	15,181	32,215	19,896,623
1943	46,133,715	378	137,558	2,664,142	1,028	18,032	44,094	19,205,415
1944	23,608,421	296	111,455	2,248,830	1,048	17,698	39,995	17,724,473
1945	18,525,041	234	100,935	2,226,780	1,485	17,044	35,773	16,676,521
1946	10,816,426	213	142,613	2,240,151	1,754	17,036	36,147	19,903,509
1947	11,512,719	68	168,279	2,557,653	2,150	18,696	38,745	23,868,179
1948	13,172,094	208	154,802	3,011,011	2,298	25,143	45,164	30,155,337
1949	10,752,817	222	102,618	2,894,886	2,403	26,853	47,703	27,474,322
1950	11,903,043	196	130,390	3,492,278	3,141	27,007	45,776	29,323,268
1951	22,538,739	336	116,503	2,787,882	3,212	30,336	55,714	38,931,539
1952	23,874,408	625	124,594	2,813,643	3,606	30,066	53,203	35,997,231
1953	37,306,341	864	119,218	2,200,000	2,941	21,754	37,809	22,247,780
1954	42,344,795	927	96,146	3,417,072	4,523	17,823	35,150	21,602,205
1955	43,043,000	1,152	88,577	2,772,073	4,323	15,805	35,350	22,240,009
1956[1]	37,500,000	905	97,000	2,248,000	4,300	20,500	41,000	26,662,400

1. Estimated by U.S. Bureau of Mines.

2 PROSPECTOR'S DRILLS That Will Work Efficiently and save you money

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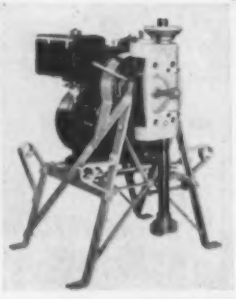
Here's a completely unitized, lightweight, portable, high capacity rock drill and breaker that's an ideal tool for mines or prospectors alike. The gasoline-powered PIONJAR BHR 50 weighs only 66 pounds—yet will drill up to 20 feet at 11 inches per minute in medium granite with a 1.06-inch bit. It is easily portable by one man. No auxiliary equipment is needed. A special, patented floatless type carburetor enables you to drill up to 45° above horizontal. It is fully enclosed, sturdy, and easily convertible from a drill to breaker. A variety of tools are attachable, with world-wide parts and service availability. Uses only 6/100 of a pint of fuel per drilled foot. Efficient at high altitudes. Companion to the larger Model BHR 65. Ask about PIONJAR combination ROCK DRILLS and BREAKERS today.

X-RAY DIAMOND DRILL



Highly portable, the X-RAY DIAMOND DRILL breaks down in 100 lb. components — weighs only 205 pounds complete. It can be truck, jeep, or skid mounted, and will drill in any position to 360° radius. Users testify the X-Ray will easily go to 200 feet, and will take core samples at any point. 7 hp. gasoline engine or air motor powered, it is economical to operate . . . easy on fuel. Furnished complete with water pump and 2-speed head. X-RAY DIAMOND DRILLS will amaze you in high performance and low cost. Price is less than $2,000.00 fully equipped for 100' of drilling. For a light weight, efficient diamond drill you'll be way ahead with X-RAY.

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(formerly Telluride Mines, Inc.), and closed its Treasury Tunnel mill at Red Mountain, Ouray County, late in the year. Underground workings connect the two mills. Operation of Pandora mill was reportedly more economical under existing conditions and with a shortage of skilled miners.

The English firm, Camp Bird Ltd., long-time owners of the Camp Bird mine in Ouray County, took over operation of the mine from King Lease, Inc. and started a large-scale exploration and development program. Plans were underway for a major mill expansion at year's end.

The Eagle mine of the New Jersey Zinc Company at Gilman was, as usual, the state's leading zinc producer. Silver and copper output from the mine were lower as less ore of this type was mined than in 1955.

The Rico Argentine Mining Company operated its differential lead-zinc-iron flotation mill at Rico and its new 200-ton-per-day contact sulphuric acid plant, using pyrite as feed, at capacities during the year. All acid was trucked to Colorado Plateau uranium mills.

The American Smelting and Refining Company operated its zinc-lead-copper Keystone mine and mill at Crested Butte and started a major exploration program under a $107,220 DMEA contract.

At Leadville, Resurrection Mining Company and American Smelting and Refining Company continued their joint operations and rehabilitated the No. 2 unit of the Resurrection mill to treat 450 tons of mixed lead-zinc sulphide ores daily. At the Irene mine, ore mined from stope production and development totalled 300 tons per day at year's end. Mining in Iowa Gulch through the Hellena and Julia Fisk shafts produced an average of 150 tons of ore daily.

Climax Molybdenum Company established record highs in tons of ore mined and milled and number of men employed during 1956. A new mill grinding circuit increasing mill capacity by 3,500 daily tons was placed in operation in mid-year. An identical unit went into operation early in 1957 to increase molybdenite recovery by about 3.5 percent. Mill tonnage reached 34,000 daily tons during the year.

In the mine the development of the two-level draw system necessitated mining of lower than average grade ore so total pounds of molybdenum produced during the year were about 37,500,000, down from 43,043,000 in 1955. An underground ore pass was completed so that Phillipson level ore could be dropped to the Storke level and trammed to surface for transfer to the mill.

Five Colorado uranium mills operated throughout the year. They were Union Carbide Nuclear Company's Uravan mill, 850 tons daily, and Rifle, 280 tons; Vanadium Corporation of America's Durango, 430 tons, and Naturita, 350 tons; and Climax Uranium Company's Grand Junction, 350 tons. Colorado had the largest number of mills in operation but was behind New Mexico and Utah in total daily capacity. Uranium reserves totalled 4,100,000 tons at year's end, third behind New Mexico and Utah. However, Colorado's reserves were the highest grade in the United States—0.33 percent U_3O_8 compared with national average of 0.25. More than 150 companies and individuals mined ore, largely in the Uravan Mineral Belt, during the year.

At year's end Union Carbide was building a new 1,000-ton-per-day mill to replace the existing Rifle mill, and started

construction of a new mill at Maybell, Moffat County at property purchased from Trace Elements Company. Also Gunnison Mining Company was building a 200-ton mill in Gunnison County. This is the first non-sandstone ore mill in state.

Cold Spring Tungsten, Inc. and the Wah Chang Corporation operated tungsten mills in Boulder County's ferberite district. Wolframite continued to be an important Climax byproduct.

In the Cripple Creek district, Golden Cycle Corporation operated its 1,000-ton custom mill treating ores and dumps from district mines. The Cresson, Ajax, Strong, and Vindicator mines were leading producers.

Colorado was again the leading vanadium producing state with all production a byproduct of uranium.

Eastern

● New York Zinc Output Up 11 Percent Last Year; New Plants Planned in Virginia

New York took over the second spot among the nation's zinc producing states with a solid increase of 11 per cent over the output registered in 1955. Last year's production was estimated at 58,600 tons and originated principally from the Edwards and Balmat mines of St. Joseph Lead Company. Stepped-up operations at these two mines also resulted in a 600-ton increase in the amount of lead produced in New York which accounted for 1,600 tons in 1956.

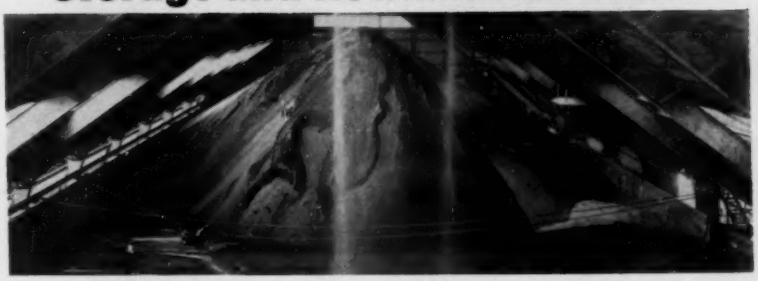
In Virginia lead production of 3,000 tons was very nearly the same as in 1955. Zinc output was up 4 percent, however, to 19,100 tons which was the largest since 1944. The Austinville mine and 2,400-ton mill of New Jersey Zinc Company operated throughout the year in Virginia. New Jersey Zinc continued work on a major mine development and modernization program which included the Austinville mine and mill and the nearby Ivanhoe mine. A 13,000-foot tunnel was started to connect the underground workings of the two mines. Tri-State Zinc, Inc. conducted drilling and development work, and began constructing a mill at a zinc deposit near Timberville, Virginia. Incidentally the Austinville mine of New Jersey Zinc celebrated its 200th anniversary last year.

After being closed for over a year, New Jersey Zinc Company's Sterling mine at Ogdensburg, New Jersey was reopened in September 1956. The loss of production for the first 8 months of the year accounted for the low output of 4,400 tons of zinc from New Jersey last year.

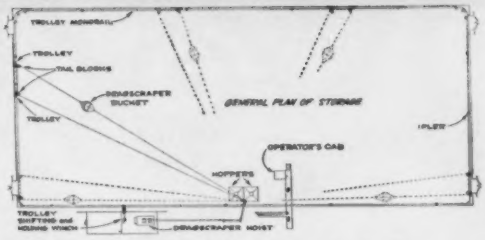
Copper continued to be recovered from the magnetite-pyrite-chalcopyrite ores of the Bethlehem-Cornwall Corporation's mine in Lebanon County, Pennsylvania. The 1956 recoverable output of copper from Pennsylvania was 4,141 tons which was almost identical to the 1955 figure. Vermont copper production was down 21 percent to 3,390 tons. The Elizabeth mine of Appalachian Sulphides, Inc. was the only producer. Appalachian Sulphides conducted an extensive exploration program in the general area of the Elizabeth mine during 1956.

A new plan to recover cadmium was completed by the New Jersey Zinc Com-

Three Sauerman Methods for Cutting Storage and Reclamation Costs

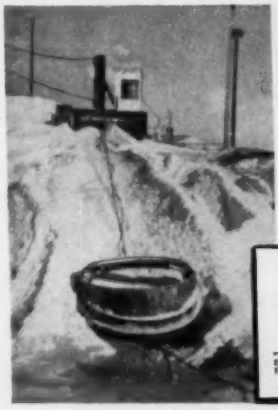


INDOOR RECLAMATION

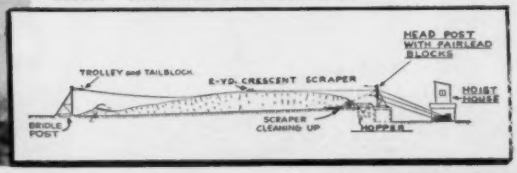


DragScraper with Trolley and Monorail—Material dropped onto stockpiles from an overhead conveyor is reclaimed to hoppers by a 2½-cu. yd. DragScraper. The installation uses a monorail and trolley system to permit shifting of the scraper bucket by remote control from operator's station at right.—*Sauerman News No. 143.*

OPEN STORAGE

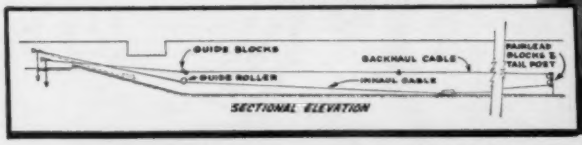


DragScraper with Trolley and Elevated Bridle—DragScraper is reclaiming raw potash to hopper from storage pile. Material is dumped at rear of the pile and moved closer to hopper during intervals when mill requirements are satisfied. Trolley and tail block travel on an elevated bridle between two stiff-leg bridle posts. Shifting of the trolley is provided by a third drum on the Sauerman DragScraper Hoist—*Sauerman News No. 146.*



HANDLING HOT MATERIAL

DragScraper—Hot scale is dropped from ingot buggy track into tunnel and is conveyed by DragScraper to a water sluiceway for disposal. Safety is important here—personnel and vulnerable equipment do not enter the hazardous area.
—*Sauerman News No. 146.*



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Production of Important Metals and Minerals in New Jersey, New York, Pennsylvania, Vermont and Virginia in 1955 and 1956*

Metal	New Jersey		New York		Pennsylvania		Vermont		Virginia	
	1955	1956	1955	1956	1955	1956	1955	1956	1955	1956
Silver[1]			66,162	74,000	10,379	11,000	50,447	36,600		
Gold[1]					1,610	1,650	181	140		
Copper[2]					4,110	4,141	4,305	3,400		
Lead[2]			1,037	1,600			2,999	2,961		
Zinc[2]	11,643	4,400	53,016	59,000			18,329	19,068		
Iron[3]	759,550	920,000	3,201,927	3,800,000	880,000	(6)				
Cobalt[4]					478,840	590,000				
Manganese[5]							25,600	(6)	32,654	21,000

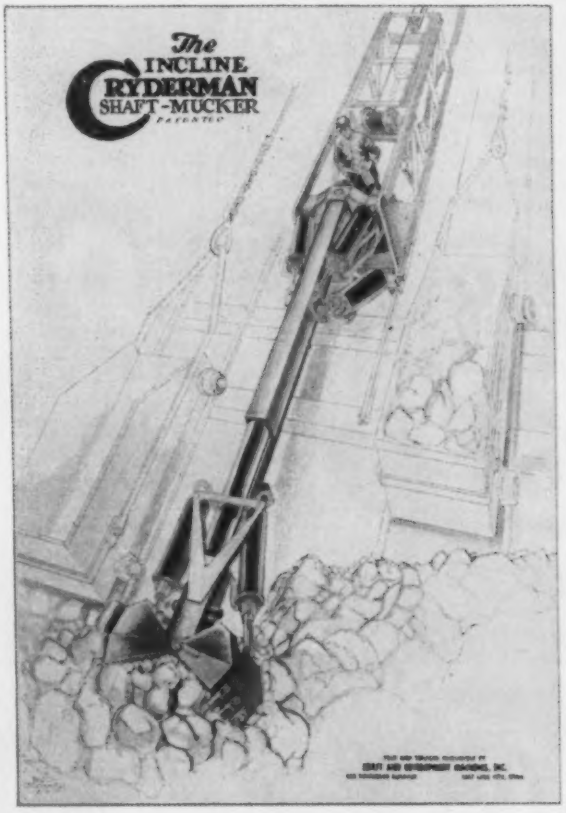
* Estimated by U. S. Bureau of Mines. 1. Fine ounces. 2. Short tons. 3. Long tons. 4. Pounds. 5. 35% or more Mn, gross weight in tons. 6. Not available.

pany at its Palmerton, Pennsylvania smelter. Cadmium occurring in the ores smelted by New Jersey Zinc, was formerly sold to other smelters to be recovered.

National Lead Company, in February 1956, made public its plans to expand the capacity of its Tahawus, New York ilmenite mine and beneficiating plant by 25 percent. The expansion was completed near the end of the year. Crude ore production at Tahawus amounted to 1,522,197 long tons in 1956, a gain of about 15 percent. National Lead also sold the first lots of metallic nickel from its new Crum Lynne refinery in Pennsylvania. The company treats nickel-oxide sinter produced at the government owned plant at Nicaro, Cuba. The latter facility is operated by National Lead.

Republic Steel Corporation re-opened the Fisher Hill iron-ore mine near Mineville, New York last year. Three mines in the Port Henry district near Mineville, New York were operated by Republic Steel during 1956. The Fisher Hill mine produces both magnetic and non-magnetic ore which is up-graded in a beneficiation plant. The Old Bed and Harmony mines of Republic Steel yield magnetite, some of which is shipped directly as lump ore. Total output of iron ore from New York which includes the above mines plus the Jones & Laughlin Ore Company's Benson mine in New York was 3,800,000 long tons which is about 600,000 tons greater than the production registered in 1955.

In Virginia, Metal and Thermit Corporation announced that it would build a $750,000 mining and processing plant west of Montpelier to produce ilmenite and rutile. Initial production was expected during the first quarter of this year.



The new INCLINE Cryderman Shaft Mucker with positive crowding and digging action is built to take the abuses of shaft mucking.

Seven air cylinders activated by two control levers give excessive power to the telescopic boom for crowding the clam into the muck for a full load. Also, the square boom feature makes for easier operation as it maintains the clam in a fixed position.

In this incline model telescopic air aubing replaces the 25-foot hoses normally used on the vertical model.

Having full view of the shaft bottom, the operator can place the clam at any desired location. This is POSITIVE ACTION! This ample, positive power in lifting, swinging or crowding has made the INCLINE CRYDERMAN outstanding in its field.

CALL, WIRE OR WRITE US FOR FULL PARTICULARS ON INCLINE OR VERTICAL MODEL

SHAFT AND DEVELOPMENT MACHINES, INC.

808 Newhouse Building EMpire 3-5373 Salt Lake City, Utah

Idaho

● Bunker Hill Expanding Zinc Plant Capacity; New Mines And Plants For Phosphate

Important production increases in cobalt, mercury, phosphate, copper, columbium, and tantalum helped offset decreases in output of the metals for which Idaho is most noted—silver, lead, and zinc. Value of all minerals produced in Idaho in 1956 was approximately $73,000,000, including about $7,000,000 for sand and gravel and stone. This was a gain of nearly 7 percent over 1955, but well below the 1951 record of $82,800,000.

Although the state's lead output declined 2 percent to less than 63,000 tons last year, a higher average price boosted value of the metal by nearly $1,000,000 to a total of over $20,000,000.

Second to lead in value of production was zinc at about $12,500,000, despite a production decline of nearly 15 percent to the lowest figure since 1939. Silver production, down 6 percent, was valued at about $11,800,000. Gold production declined for the sixth consecutive year to the lowest point since the state's earliest mining days. Only about $320,000 worth of the yellow metal was mined in Idaho last year.

Copper production rose about 20 percent over 1955 and had a value approaching $6,000,000. Cobalt figures were not released but production is known to have increased substantially over the 1955 output of 1,691,334 pounds. Mercury output was up more than 300 percent to about 3,400 flasks, valued at nearly $900,000. Production of phosphate rock was up 9 percent to about 1,450,000 tons valued at approximately $6,300,000. Tungsten output declined nearly 13 percent. Antimony production was down somewhat. There was some titanium and nickel production.

Cobalt concentrates were produced at the Blackbird mine and mill in Lemhi County by Calera Mining Company, subsidiary of Howe Sound Mining Company, and shipped to the firm's Garfield, Utah,

DAVISON CHEMICAL CORPORATION

dries petroleum catalyst with a STANDARD HERSEY ROTARY DRYER

Intermediate Feed System makes Combination Dryer

The patented STANDARD-HERSEY intermediate-feed system makes the dryer used by Davison Chemical Corporation a combination flash and rotary dryer. This combination retains the most desirable characteristics of each.

Here is another example of the engineering skill developed by the 52 year old Standard Steel Corporation. Thousands of successful dryer applications such as this give STANDARD-HERSEY an unsurpassed background to draw on in solving your drying problems. More than 30 different dryer types are available to fit any drying requirement. Contact STANDARD-HERSEY for the most profitable, most productive solution to your drying needs.

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Learn how STANDARD-HERSEY has aided manufacturers throughout the world in solving their dryer problems.

COMPLETE PILOT PLANT TAKES GUESSWORK OUT OF DRYING
STANDARD-HERSEY'S pilot dryers play an important part in solving your drying problems *before* blueprint stage.

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General Offices and Factory, 5031 Boyle Avenue, Los Angeles 58, California

LEADER IRON WORKS

(Division of Standard Steel Corporation)
Decatur 31, Illinois
Eastern Sales Office, 15 Park Row, New York 38, N. Y.

ROTARY DRYERS • KILNS • COOLERS • ASPHALT PLANTS

Idaho Production of Gold, Silver, Copper, Lead, Zinc, Phosphate, Mercury, and Tungsten 1941 to 1956. Dollar Value for Base Metals Given

Year	Phosphate Long Tons	Mercury Flasks	Tungsten Conc. 60 percent WO3 Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollars Value
1941	97,274	NA	663	149,816	16,672,410	3,621	104,914	79,084	$41,776,848
1942	115,263[2]	NA	2,132	95,020	14,644,890	3,430	113,909	87,256	46,063,326
1943	108,916	4,261	4,878	30,808	11,700,180	2,324	96,457	86,707	43,199,910
1944	112,565	1,332	3,957	25,008	9,931,614	1,688	83,530	91,372	42,591,137
1945	123,340	627	2,130	17,780	8,142,667	1,548	68,447	83,463	37,799,975
1946	312,658[2]	868	641	42,975	6,491,104	1,038	59,987	71,507	37,610,123
1947	845,045	886	61	64,982	10,345,779	1,640	78,944	83,069	55,164,670
1948	434,375	543	86	58,454	11,448,875	1,624	88,544	86,267	67,758,290
1949	471,305	—	66	77,829	10,049,257	1,438	79,299	76,555	56,429,796
1950	573,044	—	222	79,652	16,095,019	2,107	100,025	87,890	70,198,647
1951	695,026	357	377	43,064	14,753,023	2,160	76,713	78,121	70,953,653
1952	620,551	887	333	32,997	14,923,165	3,213	73,719	74,317	64,626,967
1953	1,001,969	NA	441	17,630	13,636,680	2,100	69,885	68,650	47,729,814
1954	1,092,817	—	450	13,245	15,867,414	4,828	69,302	61,528	49,951,702
1955	1,329,959	1,107	642	10,572	13,831,458	5,618	64,163	53,314	49,315,034
1956[1]	1,450,000	3,400	560	9,180	13,016,280	6,729	62,699	46,483	50,354,683

1. Estimated by U.S. Bureau of Mines. 2. Includes Utah production. NA—Not available.

Day's work for miner is drilling this 50-ft. long stope with 6-ft. holes using 4-point Intra-Set steel. Brunner & Lay offers Intra-Set in both cross and chisel types —gauge sizes: 1-11/32 thru 2½".

WESTERN OPERATOR BOOSTS PHOSPHATE ROCK OUTPUT

Uses 4-Point Brunner & Lay Carbide Intra-Set Steel

You, too, can get out more ore by using the popular Intra-Set, carbide-tipped alloy drill steel. The carbides speed drilling, stay sharp and on the job longer. This 4-point Intra-Set affords easier starting and following and use of smaller bit sizes. No attachments to lose, bind or stick. Only Brunner & Lay offers 4-point type integral carbide bit and steel. See what it can do for you. Write! Ask for just-off-the-press catalog No. 756.

Brunner & Lay Products

Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. • Brunner & Lay Rock Bit of Philadelphia, Inc., 2514 East Cumberland St., Philadelphia 25, Pa. • Brunner & Lay of Los Angeles, Inc., 2425 East 37th St., Los Angeles 58, Calif. • Brunner & Lay, Inc., 150 Leslie St., Dallas, Texas • Brunner & Lay Rock Bit of Ashville, Inc., Sweeten Creek Rd., Ashville, N.C. • Brunner & Lay of Portland, Inc., 660 N. Tillamook St., Portland 12, Ore. • Birmingham Rock Bit Co., Inc., 5-18th St., S.W., Birmingham, Ala. • Brunner & Lay, Inc., 2 Santa Fe Drive, Denver, Colo.

refinery. The same mine accounted for about half the state's 1956 copper production.

Substantial tonnages of copper were recovered from tetrahedrite and chalcopyrite ores mined by Sunshine, Polaris, and Bunker Hill mining companies and American Smelting and Refining Company in the Silver Belt of the Coeur d'Alene mining region, Shoshone County. Among small mines, Idaho Alta Metals Corporation produced from the old Empire Copper workings in Custer County.

Bulk of Idaho's 1956 quicksilver was produced by Rare Metals Corporation of America at the Idaho-Almaden mine, Washington County. Next largest producer was Holly Minerals Corporation at the Hermes mine, Valley County, formerly the Cinnabar operated by United Mercury Mines Corporation.

Columbium and tantalum were recovered by Porter Brothers Corporation, which began full-scale operations with two dredges in Bear Valley, Valley County, early in the year. Monazite dredges formerly operated by two other firms in the same county remained idle for lack of a market.

J. R. Simplot Company, operator of the state's largest phosphate mine (the Gay open-pit operation in Bingham County), commenced production at its Centennial Mountain open-pit phosphate mine in Clark County, with production being trucked to Lakeview, Montana, for rail shipment to Canadian consumers. Other southern Idaho phosphate producers were the Anaconda Company, Monsanto Chemical Company, San Francisco Chemical Company, Westvaco Chemical Division of Food Machinery and Chemical Corporation, and J. A. Terteling & Sons. Stauffer Chemical Company and Potash Company of America developed phosphate claims and the latter announced plans to build a fertilizer plant near Paris, Bear Lake County.

At Montpelier, Idaho, San Francisco Chemical Company has launched a series of pilot plant tests for calcining phosphate rock in a Dorr Fluosolids reactor. Ultimate aim is to obtain full utilization of all ore irrespective of grade and mineralogical make-up.

Production of lead, zinc and silver in the Coeur d'Alene mining region, Shoshone County, was affected adversely by a labor strike which kept a number of mines closed during January. The district's largest producer, The Bunker Hill Company, undertook a 50 percent expansion of its electrolytic zinc plant at Kellogg and stepped up its exploration program. Early this year the company announced a new 5-year program involving an expenditure of $15,000,000

for modernization of lead-zinc and by-product recovery facilities.

New ore discoveries in the Coeur d'Alene district were made by American Smelting and Refining Company at its Galena mine and in the old Morning mine, by Sunshine Mining Company and by Polaris Mining Company in the Silver Summit, New Purim, Chester and Rainbow areas of the Silver Belt. A new district shaft-sinking record was made by Hecla Mining Company in excavating its three-compartment, vertical, Silver Mountain shaft east of Mullan to a depth of 2,000 feet in less than 10 months. Sunshine and Lucky Friday Silver-Lead Mines started shaft-deepening projects, as did Asarco at its Page mine. Nabob Silver-Lead Company sank a 220-foot winze and started mining development ore.

LAKE SUPERIOR DISTRICT

• E. W. Davis Works At Full Capacity; Copper, Lead and Zinc Production Up Over 1955

Though iron ore from Minnesota, Michigan, and Wisconsin was being produced at a tremendous rate during the last half of 1956, the annual output wasn't as great as the total recorded in 1955. Lake shipments amounted to 77,633,027 gross tons in 1956 compared to 87,459,853 gross tons in 1955. Beneficiation of iron ore again received the major share of attention with consequent production of better blast furnace feed, and utilization of lower grade ores such as Minnesota taconite and Michigan jaspelite. Mine operators continued to pioneer cost saving methods, and several new deposits were opened.

Copper output in Michigan increased about 20 percent to an estimated 61,450 tons as White Pine Copper Company completed a full year of capacity production. Calumet & Hecla Inc. started producing copper ore from the Osceola Lode project in Michigan as the huge unwatering project neared completion. In Wisconsin substantial increases were registered in production of lead and zinc.

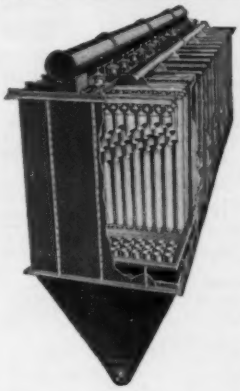
Michigan Production of Copper and Iron Ore from 1941 Through 1956.

Year	*Copper Tons*	*Iron Ore Long Tons*
1941	46,440	15,201,619
1942	45,679	16,129,474
1943	46,764	14,510,357
1944	42,421	15,425,788
1945	30,401	11,865,624
1946	21,663	8,756,802
1947	24,184	12,965,482
1948	27,777	12,896,478
1949	19,506	11,199,024
1950	25,608	12,691,101
1951	24,979	13,703,901
1952	21,699	11,779,366
1953	24,097	14,326,074
1954	23,593	9,709,167
1955	50,066	14,143,509
1956[1]	61,450	12,334,552

1. Estimated by U.S. Bureau of Mines.

THE NORTHERN BLOWER COMPANY

Mfrs. of Norblo Dust and Fume Collection Equipment
6429 Barberton Ave., Cleveland 2, Ohio

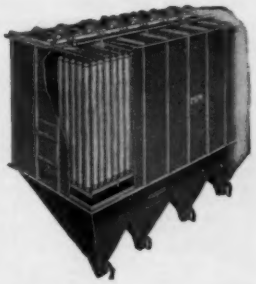


PRODUCTS: Automatic and Semi-Automatic Bag Type, H. E. L. S. Cyclone or Centrifugal Type, Hydraulic Type Dust and Fume Collectors, Cement Air Cooling System, Self-Contained or Portable Bag Type Units, Exhaust Fans . . . All designed and fabricated by our own shops.

Norblo Automatic Bag Type

For continuous or heavy duty service providing very high efficiency at very low cost of operation and maintenance. Basic unit contains 78 bags, 6" diameter, 8' 3" long. Air flow is upward, from inside, thus keeping bags fully distended. Total free cloth area per compartment 936 square feet. Shaking and cleaning controlled by electric timer, is cyclic, one compartment at a time, each having its individual compressed air shaker mechanism and the whole system variable and adjustable for dust load without shutting down. Any compartment can be cut out without affecting others. Access to interior is on the clean air side.

Norblo Standard Bag Type



For intermittent service, as fan and unit must be shut down for cleaning, usually at noon hour and end of working day. Electrical or compressed air shaking and cleaning mechanism. Basic unit has 40 bags 6" diameter, 8' 3" long, 480 square feet cloth area. In both Standard and Automatic bag types made by Norblo, extra large hoppers provide air expansion space resulting in great drop in air velocity and a maximum degree of dust separation by gravity before passing upward for final filtering.

Norblo Hydraulic

A high efficiency, wet type collector, for separation of dust mixed with smoke or fumes. In most installations the Hydraulic unit is used with a Norblo Cyclone collector, thus reducing the amount of wet sludge to be handled. There are no moving parts. Filter beds are coke or high-fired ceramic tubes, light in weight and kept in motion by ascending air stream so that beds are self-cleaning. Built in 11 standard sizes with capacities up to 26,000 cfm.

Norblo H.E.L.S. Centrifugal

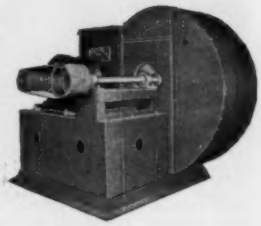
A cyclone or centrifugal type collector for all materials, from saw-dust to fly ash; characterized by high efficiency of collection with low static drop. The Norblo H. E. L. S. has no internal vanes, gadgets or dampers. High efficiency is obtained by scientific proportioning and by the patented (No. 2,259,919) expanding nozzle. These design features eliminate the power-wasting back eddy. Built in standard sizes with capacity up to 37,500 cfm.

Norblo Portable Units

Self-contained units for efficient, de-centralized dust collection. Convenient, space-saving; can be located close to the dust source. Made in six sizes in bag type, with capacities from 300 to 1350 cfm. All models have 8" static at fan. Fans exceptionally quiet.

Norblo Exhaust Fans

These high speed, low power fans have been developed especially for dust collecting systems and by proper wheel selection are adaptable to all types of materials handling. All wheels are statically and dynamically balanced. Heavy duty bearings are standard equipment.



IRON ORE SHIPMENTS IN GROSS TONS FROM MINNESOTA, MICHIGAN, AND WISCONSIN BY COMPANIES AND MINES FOR 1954, 1955, AND 1956

Company Mine	1954	1955	1956
E. C. Bradley & Sons			
Bradley	16,824	35,989	34,110
Charlson Iron Mining Co.			
Charleson Concentrator	128,113	169,310	108,607
Cleveland-Cliffs Iron Co., The			
Athens	166,448	708,341	382,354
Bunker Hill	34,558	708,341	
Cambria-Jackson	146,951	339,084	221,031
Cliffs Shaft	428,218	644,445	656,485
Humboldt	153,738	173,554	212,487
Lloyd	137,772	170,900	76,692
Maas	166,388	620,489	439,853
Mather	1,535,800	2,787,268	2,339,678
Ohio	82,873	139,180	122,401
Tilden	77,781	101,437	164,883
Spies	101,368	222,994	32,893
Agnew-Alworth	235,519	214,030	50,796
Canisteo	516,155	971,349	993,816
Hawkins	288,819	847,279	800,242
Hill-Trumbull	304,783	737,149	554,924
Holman-Cliffs	679,345	1,070,630	956,648
Sargent	74,998	74,092	102,393
Wanless			257,349
Cliffs Pellets			35,000
Research Lab. conc.			865
Total Shipments	5,131,514	9,822,179	8,400,790
M. A. Hanna Company			
Cannon	205,380	238,075	327,487
Hiawatha	530,229	613,709	542,187
Homer	433,632	459,603	433,354
Wauseca	481,886	480,820	503,716
Richmond	83,378	113,987	
Wakefield	152,287		
Bray	109,802	714,662	556,624
Gordon	100,901	209,552	640,296
Mesaba Chief	182,738	477,727	224,367
Stein	340,002	429,679	101,662
Enterprise	809,474	1,545,634	1,061,892
Brunt	16,544	15,323	
Impro "B"	44,829	106,366	
Norpac	52,976	125,967	29,206
Pillsbury Addition	7,016		
Buckeye	467,599	43,136	50,024
Section 18	478,022	110,803	
Shiras	1,251		
Douglas	93,465	64,577	172,453
Duncan	214,622	666,348	232,685
Argonne	18,333	20,908	
Leach	2,232		
Perry	271,501	286,100	494,069
Carlz No. 2	363,128	466,435	33,643
Harrison	71,516	64,558	137,925
North Harrison	80,286	100,995	84,276
Halobe	90,029	70,814	83,261
Quinn	183,362	398,141	39,611
Lot No. 1	59,183	46,662	
Wyman	82,046	179,554	183,487
Patrick A	254,108	129,099	655,565
Patrick Annex	5,880	67,772	113,508
Olson	338,083	520,187	496,319
Kevin A	26,409	175,866	76,926
Kevin B	86,357	166,597	
Patrick B	114,305	583	
Patrick C	239,755	48,995	
Galbraith	227,171	42,368	
Aromac	127,604	103,574	91,104
MacKillican	162,704	92,065	488
Weggum	147,970	343,256	326,648
Weggum South Longyear	288,060	91,133	
South Agnew	331,015	663,580	744,716
Agnew No. 2	206,991	405,634	440,220
Morton	600,245	624,678	379,826
Hillcrest Extension	28,430	55,109	
Feigh	1,180		203,020
Huntington	19,863	3,057	34,453
South Hillcrest	88,708	112,439	77,966
Cuyuna Fee	188,002	244,110	305,202
Section 6	9,590	15,121	
Snowshoe	17,743		
Louise No. 1	17,069	11,421	43,464
Louise No. 2	57,832	103,914	
Portsmouth	448,060	686,238	567,082
South Yawkey	46,235	15,502	
North Yawkey	103,080	270,971	10,787
Spring Valley	150,512	240,418	275,576
Jennison	8,411		
Alstead	100,164		88,440
Maroco	26,409		
Mangan Joan	829		
Louise	51,366		
Rowe	1,468		13,860
Mallen	28,882		
Bengal-Tully	270,816		
West Alpena		6,804	81,294
Harrison B		135,766	127,701
Snyder		25,866	68,400
South Ann		94,486	
Campbell "D"		198,965	27,802
South Alstead		1,715	
North Hillcrest		5,495	
Central Feigh		235,368	
Hunner			733,537
Hunt			345,256
South Eddy			299,997
Total Shipments	10,360,610	13,988,287	12,461,382
Haley-Young Mining Company, E. A. Young, Inc., and Range Mining & Contracting Co.[3]			
Minnewas	52,862	72,128	71,758
Mississippi No. 1			
Elbern	46,405	106,685	122,876
Ernie Mine			
Atkins	18,009		
Total Shipments	144,892	178,813	194,634
Inland Steel Company			
Armour No. 1	151,815	209,682	166,702
Armour No. 2	131,079	106,167	116,485
Armour No. 2 (Pit stockpile)	108,477		
Morris	326,001	335,940	302,710
Greenwood	85,942	81,578	63,241
Sherwood	430,679	402,947	393,991
Bristol	268,516	324,914	300,564
Cayia (Stockpile)	44,492		
Total	1,547001	1,461,228	1,343,693
Jones & Laughlin Steel Corporation			
Hill Annex	532,075	721,955	603,162
Longyear	474,556	828,255	566,794
Columbia	436,153	777,389	664,937
Missabe Mountain	5,118	50,677	48,850
Wentworth	309,778	175,656	108,973
Schley		219,402	215,133
Pettit		250,857	262,219
Graham No. 1[4]			16,902
Graham No. 2[5]			64,782
Leetonia			21,940
Tracy			405,604
Total Shipments	1,757,680	3,024,191	2,979,476
W. S. Moore Company			
Margaret	10,168	71,997	4,758
Hanna	35,615	22,390	
Judson	169,858	309,371	258,034
Pilot-Annex	31,452	91,144	14,366
Pilot	20,476	3,225	
Prindle	42,668	42,217	
Prindle Stockpile	9,237	7,512	
Yawkey	3,336		1,833
Knox	109,098	8,122	
Stubler		27,525	27,140
Norman	3,691		1,307
Gilbert Silver		35,058	
Alice			23,116
Graff			2,967
Mariska			153,303
Total Shipments	508,915	618,566	486,828
North Range Mining Company			
Blueberry	88,832		
Champion	160,746	151,364	137,447
Book	60,979	143,038	113,158
Warner	154,785	158,060	166,234
Leonidas	8,933	193,179	137,371
Penokee		370,438	511,287
Fortune Lake conc.			2,261
Total Shipments	474,275	1,016,080	1,167,758
Oglebay, Norton & Co.			
Montreal	938,284	1,090,951	855,807
St James (St James Mining Co.)	201,377	405,235	328,960
Canton Property	498,008	716,446	
Total Shipments	699,385	2,212,632	1,184,767
Oliver Iron Mining Division			
West Davis-Geneva U. G.	576,686	670,011	
Pioneer U. G.	745,027	849,411	798,223
Sibley U. G.	67,744		
Soudan	166,139	208,544	208,809
Mountain Iron Group	1,330,215	1,115,486	545,952
Rouchleau Group	4,755,059	5,841,415	5,212,154
Spruce O. P.	984,914	1,496,077	1,076,151
Fayal O. P.	175,413		
Canton	1,281,040	1,840,639	1,224,065
Canton (St. James)	498,008	716,446	695,698
Pilotac (Taconite conc.)	360,363	632,195	676,797
Gilbert	740,564	2,100,138	2,124,054
Sauntry	150,036	329,372	
Hull-Rust Group	2,152,379	3,755,504	3,282,332
Sherman Group	5,977,917	6,382,955	5,727,793
Monroe Group	1,123,435	2,822,454	2,287,916
Pillsbury	221,453	279,309	178,097
Kosmeri	434,756	627,395	624,541
Pillsbury Brown	100,856	21,105	26,809
Fraser U. G.	244,098		
Godfrey U. G.	507,230	132,560	
King	1,538,461	1,446,676	1,056,114
Plummer	307,954	2,191,969	1,782,020
Gross Marble	792,143		
Morris Group			156,972
Midway Group		17,291	12,006
Niles		184,032	58,503
Dormer		473,963	255,637
Arctus Group		672,420	503,928
Mariska Extension			101,962
Leonidas Stockpile		300,103	354,467
McKinley		11,731	
Franklin			1,913
Hopewell			77,729
Rouchleau			3,254
Union Stockpile			15,998
Total Shipments	25,231,883	35,119,231	29,069,696
Pioneer Mining Company			
Mary Ellen (Conc.)	461,535	452,152	315,940
Pacific Isle Mining Company**			
The Drew, Croxton-Syme	128,213		27,591
Dunwoody L.O.S.P.	45,215[1]		
Emmett		111,263	1,181
Graham No. 2	47,076	75,454	74,782
UnoKerr Area	21,415	181,9863	157,085*
Lamberton	26,387		
Missabe Mountain L.O.S.P.	9,349	10,596	14,506
Missabe Mountain So. Lease	3,186		
North Shiras	9,742[2]	8,711	5,401
Wacootah (A&B)	169,147	196,239*	153,397
York	60,126		
Brunt Trespass	16,544		
Pacific Fee	1,410		
Silver L.O.S.P.	5,483		
Alpena L.O.S.P	48,982		7,721
Bradford	32,915		26,553
Chataco	34,147		31,583
Holland		8,346	74,740
Mississippi		46,249	3,555
Pillsbury Trespass		11,120	
Missouri L.O.S.P.		3,743	
Commodore—Union Area			243,537*
Genoa-Sparta			8,116
St. Paul			218,212
Sidney			4,683
Stevenson			14,452
Susquehanna-Retreat			12,748
Wakefield			237,794
Total Shipments	531,124	653,707	1,317,637
Pickands Mather & Company			
Zenith	366,681	413,094	355,784
Erie (taconite)	184,314	189,724	227,994
Embarras	749,061	1,046,434	672,383
Biwabik	168,287	238,743	
Corsica	75,388		
Albany	252,054	345,136	321,566
Scranton	606,884	799,859	529,031
Mahoning	1,589,451	2,023,299	1,805,109
Carmi	622,209	454,703	444,913
Bennett	466,869	601,778	493,175
Danube	454,275	708,207	615,800
West Hill	605,638	760,071	658,431
Rabbit Lake	151,484	327,770	301,508
Mahnomen	75,167	455,700	343,753
Sagamore	297,907	302,263	148,940
Cary	482,646	684,809	542,525
Newport	482,458	581,678	528,354
Peterson	196,952	415,841	425,466
Anvil-Palms-Keweenaw	458,715	543,365	489,956
Sunday Lake	248,212	407,222	282,493
James	77,596		
Buck Unit	311,036	556,229	422,596
Fortune Lake	226,000	375,509	346,816
Wade		151,842	
Volunteer		111,356	128,810
Tioga No. 2		405,749	564,517
Geneva		62,908	466,805
Loomis		112,478	
Lamberton Annex			6,858
Lawrence			6,379
Cornell			35,305
Total Shipments	9,149,277	13,075,767	11,165,267

IRON ORE SHIPMENTS IN GROSS TONS FROM MINNESOTA, MICHIGAN, AND WISCONSIN BY COMPANIES AND MINES FOR 1954, 1955, AND 1956

Company Mine	1954	1955	1956
Republic Steel Corporation			
Union Lean Ore (Stockpile)	207,208		
Susquehanna (Susquehanna Ore Company)	669,963	996,926	663,298
Stevenson	176,842	191,505	
Penokee	262,433	13,790	
Monongahela (Tobin)	289,886	262,589	190,929
Total Shipments	1,606,332	1,437,810	854,227
Reserve Mining Company			
E. W. Davis Works Taconite Pellets	279,970	380,214	3,584,736
Rhude & Fryberger Company			
Boeing	355,792	424,441	344,655
Troy	53,327	176,894	152,035
Pennington	55,709	113,802	3,264
Carlson-Nelson			37,739
Hillcrest Stockpile			46,899
Total Shipments	464,828	715,137	584,592
Schroeder Mining Company			
Krueger		30,000	74,000
Snyder Mining Company			
Webb	301,029		
Whiteside	293,767	328,644	383,340
Shenango		5,600	
Webb-Sellers		484,991	532,925
South Tener		2,228	
Total Shipments	594,796	821,463	916,265
Zontelli Brothers, Inc.			
Virginia	28,425	25,022	4,236
Mangan-Joan	66,763	181,790	108,757
Merritt Stockpile	6,743	12,933	35,071
Manuel	61,226	80,722	42,949
Graham No. 1	70,645	93,663	16,902
West Airport Mine		67,335	47,594
Penokee Stockpile		4,801	20,902
Meress		108,119	84,276
Mangan-Stai			25,607
Total Shipments	233,802	574,385	386,294

L.O.S.P. Lean ore stockpile.
** Includes mines of the Hedman Mining Company, Pittsburgh Pacific Company, and Bradford Mining Company.
* Includes tonnage produced for others in trespass operations.
[1] Also includes production from Sec. 34 L.O.S.P.
[2] Also includes production from Shiras Trespass.
[3] Includes Uni-Kerr-Lamberton Area.
[4] Mined for Zontelli Bros., Inc., delivered to J & L Steel Corp.
[5] Mined for Pacific Isle, delivered to J & L Steel Corp.
[6] Young-Montana Corp. shipped 3,376 gross tons from Running Wolf property in Montana.

Overshadowing most developments on the iron ranges, was the attainment of full production of taconite pellets from Reserve Mining Company's E. W. Davis Works at Silver Bay, Minnesota. Limited production from one of the 12 sections of the E. W. Davis plant began in the final quarter of 1955, but all 12 sections were operating early in March 1956 and the plant was formally dedicated in September 1956. In Minnesota's second, but initially larger, taconite project near Aurora, Erie Mining Company continued plant construction, and by the end of the year most of the equipment was in place and the project was reportedly 75 percent complete. Planned capacity of the Erie project is 7,500,000 tons of taconite pellets annually; the Reserve plant is rated at 3,750,000 tons of pellets per year, but ultimately output will be expanded to 10,000,000 tons.

Another significant development taking place, was the start of another flotation plant by Cleveland Cliffs Iron Company at Marquette Iron Mining Company's Republic mine on the Michigan section of the Marquette Range. Using a fatty acid collector (Acintol FA No. 2), jaspelite ore, assaying 40 percent iron, is up-graded to 63.5 percent iron. Flotation concentrate is then pelletized at the Eagle Mills unit in Michigan using the flying saucer, manufactured by the Dwight-Lloyd Division, McDowell Company, Inc. Green pellets are hardened on the world's largest Dwight-Lloyd grate machine. The Eagle Mills pellet plant was the first to treat hematite flotation concentrate.

Wisconsin Production of Iron Ore, Lead, and Zinc From 1950 Through 1956

Year	Iron Ore Long Tons	Lead Tons	Zinc Tons
1950		532	5,722
1951	1,745,120	1,391	15,754
1952	1,485,845	2,000	20,588
1953	1,655,331	2,094	16,830
1954	1,428,910	1,261	15,534
1955	1,886,029	1,948	18,326
1956[1]	1,491,054	2,725	24,065

1. Estimated by U.S. Bureau of Mines.

On the Mesabi Range, the first commercial flotation plant for treating taconite ore is under construction by Jones & Laughlin Steel Corporation at Calumet, Minnesota. This operation will be quite novel in that tailings accumulated since 1914 from the Hill Annex and Arthur mines will be reclaimed by hydraulic dredging. The low-grade tailings will then be up-graded using Humphrey spirals and sulfonate flotation at the Calumet plant.

Another important development taking place on the Mesabi, near Aurora, is the stripping program undertaken at the Stephens property by Oliver Iron Mining Division of U. S. Steel Corporation. The Stephens property is thought to contain the largest undeveloped reserves of direct-shipping ore on the iron ranges.

Washing plants were placed in operation by Pacific Isle Mining Company at the St. Paul mine and by Snyder Mining Company at the Webb mine near Hibbing. Heavy media plants opened or under construction included Oliver Iron Mining Division near Coleraine, Minne-

EAGLE MILLS PELLETIZING plant of Marquette Iron Mining Company opened a new era for Michigan specular hematite ore. This plant operated by Cleveland-Cliffs Iron Company is the first to pelletize hematite flotation concentrate.

Short Tons of Ore Mined and Short Tons of Waste Stripped at Representative Open Pit Mines in the United States in 1953, 1954, 1955, and 1956

Mine	Company	1953		1954		1955		1956	
		Ore Mined	Waste Stripped	Ore Mined	Waste Stripped	Ore Mined	Waste Stripped	Ore Mined	Waste Stripped
Utah Copper	Kennecott Copper Corporation	29,922,200	43,500,106	24,079,400	35,856,651	27,740,600	45,710,091	32,321,100	N. A.
Morenci	Phelps Dodge Corporation	16,180,061	30,170,808	15,427,147	31,738,176	15,899,410	33,148,792	16,794,287	37,788,263
New Cornelia	Phelps Dodge	9,537,083	14,568,468	9,128,833	13,730,441	10,274,836	14,663,772	10,112,434	14,504,201
Chino Mines	Kennecott	7,694,082	6,077,203[1]	6,536,058	12,685,603	6,992,950	12,856,067	7,945,386	N. A.
Trail Ridge[2, 3]	Humphreys Gold Corporation	7,110,000	0	7,148,000	0	6,593,000	0	6,732,000	0
Highland[3]	Humphreys Gold	0	0	0	0	4,421,000	0	6,020,000	0
Ray Mines	Kennecott	4,728,249	10,743,635	3,657,673	9,268,105	4,818,358	10,204,329	5,852,742	N. A.
Lavender Pit	Phelps Dodge	0	0	1,651,311	13,676,967	4,433,218	8,013,961	5,069,049	6,463,378
Weed Heights	Anaconda Company	331,550	12,902,025	3,866,775	6,597,000	3,942,161	7,793,905	4,500,000	N. A.
Nevada Mines	Kennecott					3,179,784		4,316,148	N. A.
Copper Cities	Miami Copper Company	0	4,929,633	996,160	7,257,380	4,004,052	3,347,720	4,167,147	3,869,132
Saddle Creek	American Cyanamid	—	—	—	—	2,642,000	6,138,000[1]	3,590,000	3,316,000[1]
Sydney Mine	American Cyanamid	—	—	—	—	2,402,000	4,958,000[1]	3,541,000	8,276,000[1]
Tripp Pit[4]	Consolidated Copper Mines Corporation	—	—	—	—	1,233,417	5,815,413	2,719,222	10,608,314
Jacksonville Plant	Humphreys Gold	—	—	—	—	2,700,000	—	2,650,000	—
Eagle Mountain	Kaiser Steel Corporation	1,759,437	1,740,084	1,337,384	2,574,888	2,032,636	3,079,282	2,649,892	4,108,568
Pauway No. 4	Davison Chemical Company, Florida Phosphate Division	418,005[5]	—	446,000[5]	—	2,373,100[6]	2,598,400[6]	2,315,900[6]	2,951,300[6]
Berkeley Pit	Anaconda Company					921,279	—	2,288,891	N. A.
Sanford Hill	National Lead Company	1,347,293[6]	2,021,460[6]	1,335,952[6]	1,817,133[6]	1,288,617[6]	1,964,553[6]	1,522,197[6]	2,290,380[6]
Bonny Lake	Davison Chemical	429,000[5]	—	459,053[5]	—	1,393,600[6]	4,444,900[6]	1,316,500[6]	4,953,500[6]
Iron Mountain	Columbia Iron Mining Company	—	—	975,000[6]	2,633,000[1]	1,268,000[6]	951,000[1]	1,267,000[6]	911,000[1]
Desert Mound	Columbia Iron	988,000[6]	2,850,000[1]	988,000[6]	2,850,000[1]	1,005,000[6]	1,054,000[1]	1,253,000[6]	995,000[1]
Comstock	Colorado Fuel & Iron Corporation	—	—	430,651[7]	—	818,279[7]	—	910,949[7]	—
Saline County	Reynolds Mining Corporation	—	—	—	—	529,341	1,838,012[1]	496,698	1,519,724[1]
Ballard	Monsanto Chemical Company	—	—	—	—	328,630	N. A.	465,147	N. A.
Nickel Mountain	Hanna Coal & Ore Corporation, Nickel Division	—	—	124,547	—	284,416	—	437,316	—
Three Kids	Manganese, Inc.	—	—	—	—	393,088	729,420	398,100	1,188,284
Van Stone	American Smelting and Refining Company	316,675	765,062	355,626	528,182	380,334	620,033	367,441	613,780
Veteran	Kennecott	0	0	—	8,927,008	75,157	1,060,467	284,531	2,000,047
Leviathan	Anaconda	183,037	9,099,042	239,857	8,697,224	220,126	686,620	235,000	N. A.
Liberty	Consolidated Coppermines	—	—	—	—	474,096	613,377	234,757	73,727
Phosphate	Montana Phosphate Products Company	0	0	0	0	34,799	158,154[1]	116,038	419,402[1]
Pulaski County	Reynolds Mining	—	—	—	—	—	—	73,619	—
Getchell	Getchell Mine Inc.	—	—	—	—	48,160	255,700[1]	68,860	272,500[1]
Blowout	Colorado Fuel & Iron	1,010,746	—	268,722	—	305,131[7]	—	60,716[7]	—
Elizabeth	Appalachian Sulphides, Inc.	—	—	—	—	57,056	—	44,446	—
Tungsten	Nevada Massachusetts Company	—	—	37,692	382,474	35,056	414,185	27,188	388,080
Huskon	Utco Uranium Corporation	0	0	0	0	0	12,000	26,000	36,000
Rattlesnake	Continental Uranium, Inc.	—	—	—	—	7,397	—	9,393	2,551,000[8]
Pima	Pima Mining Company	0	0	0	0	0	624,000[1]	0	8,849,000[1]
Bagdad	Bagdad Copper Corporation	1,232,591	4,891,426	1,312,086	6,636,612	1,344,489	9,175,745	N. A.	N. A.

1. Cubic yards. 2. Mined by suction dredge. 3. Long tons. 4. Includes Tripp Pit, Morris Northwest Extension Pit, and Brooks Pit. 5. Products sold. 6. Gross tons. 7. Net tons. 8. Stripping completed in October 1956. N.A. Not Available.

sota and Rhude & Fryberger at the Troy mine. An HMS installation and washing units were under construction at Pickands Mather & Company's big Mahoning mine at Hibbing.

Pickands Mather & Company completed the first full year of operation of the Peterson mine at Bessemer, Michigan. M. A. Hanna Company plans to sink a 2,000-foot shaft to serve the Wauseca and

Minnesota Shipments and Average Iron Content of Usable Iron Ore[1] 1946 to 1956

Year	Long Tons	Content %
1946	49,055,340	51.48
1947	62,436,102	50.99
1948	67,923,237	49.86
1949	55,943,714	50.25
1950	64,538,759	49.37
1951	78,164,527	50.53
1952	63,906,069	50.16
1953	80,533,670	50.31
1954	48,613,338	50.94
1955	69,419,334	50.65
1956[2]	60,412,266	NA

1. Exclusive of ore containing 5 percent or more manganese.
2. Estimated by U.S. Bureau of Mines.
NA—Not available.

Homer mines on the Menominee Range. This shaft will be equipped with a friction hoist. Cleveland Cliffs Iron Mining Company placed the first Koepe, friction hoist in operation at the Cliffs shaft at Ishpeming during 1956. Jones & Laughlin Steel Corporation completed the first full year of operation of the Tracy mine at Negaunee, Michigan.

Research continued on conversion of low-grade non-magnetic iron oxides to magnetic oxides by roasting. Jones & Laughlin Steel Corporation first operated a pilot plant at its Negaunee, Michigan research laboratory on this problem. Cleveland Cliffs Iron Company is also working on magnetic roasting. Tremendous reserves of non-magnetic, low-grade ore exist which is not particularly amenable to concentration by flotation. So far flotation efforts are successful only on so-called "hard clean ores." Earthy or limonitic forms of iron ore, containing an abundance of oxidized compounds and slime forming constituents, have proven difficult to float. Efforts at magnetic roasting have utilized fluid-bed reactors.

Development of rotary blast hole drilling at open pit iron mines continued last year with chief emphasis placed on increasing bit life. Hard taconite ore poses a severe problem for rotary drills, and jet piercing rigs seem to be the only suitable machines which can handle the problem satisfactorily. Elsewhere rotary drills are finding increased application. At Reserve Mining Company, jet piercing is employed, but to obtain better fragmentation, satellite holes are drilled 6 feet deep around the main jet hole with an air-percussion drill mounted on a self-contained tractor-compressor unit. This unit has been highly successful providing better fragmentation.

Manganese Chemicals Corporation produced synthetic battery grade manganese from low grade manganiferous ores of the Cuyuna Range at its Riverton, Minnesota plant. An ammonia leaching process is employed at the Riverton operation. Shipments of manganiferous ore in 1956, from Minnesota mines amounted to approximately 602,800 short tons compared with 864,000 short tons in 1955.

Calumet & Hecla, Inc. continued to unwater the Osceola Lode at Calumet, Michigan, and during the summer of 1956 placed the Number 13 mine in production at a reported 1,500-ton-per-day rate. By fall another shaft on the Osceola Lode was in operation and hoisting about

Short Tons of Ore Mined at Representative Underground Mines in the United States in 1953, 1954, 1955, and 1956

Mine	*Company*	*1953*	*1954*	*1955*	*1956*
Climax	Climax Molybdenum Company	6,604,857	8,709,900	9,227,700	9,930,000
Butte Mines	The Anaconda Company				
Copper ore		4,230,567	3,701,677	5,211,401	6,016,593
Zinc ore		1,323,607	915,134	1,091,862	1,093,748
Manganese ore		471,642	370,288	388,609	420,074
TOTALS		6,025,816	4,987,099	6,691,872	7,530,415
Southeast Missouri mines	St. Joseph Lead Company	5,377,405	5,738,700	5,994,221	5,972,884
San Manuel	San Manuel Copper Corp.	——	——	459,726	5,496,328
White Pine	White Pine Copper Company	216,900[2]	805,356	2,971,900	3,892,760
Miami	Miami Copper Company	3,705,113	3,413,914	3,721,675	3,812,165
Calumet Division	Calumet & Hecla, Inc.	2,009,262	1,939,329	1,406,671	2,060,849
Homestake	Homestake Mining Company	1,368,059	1,485,226	1,550,116	1,627,719
Cornwall	Bethlehem Cornwall Company	——	——	1,737,610[1]	1,547,035[1]
Tri-State Mines	Eagle-Picher Company	——	1,730,696	1,606,974	1,466,630
All mines	American Zinc Company of Tennessee	——	——	791,273	993,368
No. 2				466,721	487,227
Young				16,922	200,311
Grasselli				162,406	182,145
North Friends Station				119,876	106,301
Athletic				25,350	17,384
Tri-State (Baxter Springs)	National Lead Company	——	——	749,024	803,549
Sunrise	Colorado Fuel and Iron Corporation	603,730[1]	492,304[1]	838,692[1]	725,496[1]
Illinois-Wisconsin	Eagle-Picher Company	——	229,971	619,011	721,191
Copper Queen-Bisbee	Phelps Dodge Corporation	576,658	600,320	546,001	632,088
East Side	Pend Oreille Mines and Metals Company	500,040	482,052	503,391	587,981
Bunker Hill	Bunker Hill Company	407,112	411,900	528,833	531,334
Magma	Magma Copper Company	431,749	463,915	458,488	453,683
Treasury Tunnel-Black Bear	Idarado Mining Company	260,200	267,250	274,550	480,000
Zinc	Tennessee Coal and Iron Division (USSteel)		245,870	388,570	392,407
Nellie B Division	American Zinc Lead and Smelting Company	——	——	971,175	361,872
Fredericktown	National Lead Company	——	——	293,165[2]	355,782
Hamme	Tungsten Mining Corporation	209,760	297,879	323,996	336,368
Chelan Division	Howe Sound Company	436,670	445,832	398,738	309,435
Scrub Oaks Mine	Alan Wood Steel Company	——	——	283,382	282,311
Gray	Tri-State Zinc, Inc.	279,759	287,842	310,103	278,849
Blackbird	Calera Mining Company	64,574	137,875	176,977	275,724
Iron King	Shattuck Denn Mining Corporation	——	——	222,892	253,942
Lincoln	Wah Chang Mining Corporation	43,459	168,228	264,027	251,725
Elizabeth	Appalachian Sulphides, Inc.	——	——	237,340	223,864
Sunshine	Sunshine Mining Company	249,686	250,698	225,883	200,028
Star	Hecla Mining Company	228,304	216,877	216,471	196,827
Star	Bunker Hill Company	228,304	216,877	208,189	189,821
Tungsten	Nevada-Massachusetts Company	——	151,557	178,035	185,205
Illinois	Ozark-Mahoning Company	——	——	150,324	179,472
Phosphate	Montana Phosphate Products Company	——	325,000	294,971	170,689
Benton	Wah Chang Mining Corporation	19,422	93,344	134,332	163,432
Crystal	Minerva Oil Company	66,904	14,259	95,645	155,306
Saline County	Reynolds Mining Corporation	——	——	180,181	151,874
Darwin	Anaconda Company	——	21,000	133,756[2]	146,059[2]
Washington	Alan Wood Steel Company	——	——	96,906	135,292
Getchell	Getchell Mine, Inc.	——	——	136,100	134,220
Day Mines	Day Mines, Inc.	142,331	120,355	95,177[4]	116,039
Big Buck	Standard Uranium Corporation	0	0	96,538	112,933
Page	American Smelting and Refining Company	153,718	132,656	76,831[4]	109,586
Mineral Hill	Banner Mining Company	——	——	97,464	107,334
Victory	Minerva Oil Company	——	——	9,746	93,320
Galena	American Smelting and Refining Company	0	0	56,489[4]	87,925
Misers Chest	Banner Mining Company	——	——	83,084	84,771
United Mines	United Park City Mines Company	0	19,326	79,364	83,427
Bonanza Utah Mines	American Gilsonite Company	——	——	53,538	78,349
Daisy	Banner Mining Company	——	——	60,097	76,002
Mayflower	New Park Mining Company	81,192	86,495	86,891	75,578
No. 1	Minerva Oil Company	62,841	48,272	70,651	66,771
Knob Hill	Knob Hill Mines, Inc.	59,160	56,342	60,384	61,066
Radon	Hecla Mining Company (Associates)	0	0	3,506	56,847
Triumph	Triumph Mining Company	——	76,074	77,401	56,257
U and I	Radorock Resources, Inc.	——	——	——	53,605
Lukachukai Mountains	Kerr-McGee Oil Industries, Inc.	——	——	40,000	48,000
Trout Mining Division	American Machine and Metals, Inc.	——	——	49,640	46,284
Morning	American Smelting and Refining Company	96,010	49,468	41,799[4]	45,946
Eagle & Blue Bell	Chief Consolidated Mining Company	——	——	——	44,027
Cresson	Cresson Consolidated G.M.&M. Company	——	——	33,717	42,501
Frisco	American Smelting and Refining Company	71,183	65,437	42,859[4]	42,253
Sidney	Sidney Mining Company	60,413	32,040	23,117[4]	38,847
Amelia	Tri-State Zinc, Inc.	0	0	0	35,089
Jamestown	Ozark-Mahoning Company	——	——	29,033	32,753
Shoshone	Anaconda Company	——	——	4,327[2]	27,516[2]
Radium & Owenby Groups	Dulaney Mining Company	——	——	23,595	27,451
Cowdrey	Ozark-Mahoning Company	——	——	31,291	24,382
New Idria	New Idria Mining and Chemical Company	35,486	43,282	36,236	22,511
Irene	Ressurection Mining Company	0	0	0	21,275
Chief No. 1	Chief Consolidated Mining Company	——	——	83,458	18,870
Continental No. 1	Continental Uranium, Inc.	——	——	13,884	18,515
Dysart No. 1	Rio De Oro Uranium Mines, Inc.	0	0	0	18,391
Strawberry Tungsten	New Idria Mining & Chemical Company	——	——	22,906	17,634
Victory Tungsten	Gabbs Exploration Company	——	——	21,622	16,173
Iowa Gulch	Resurrection Mining Company	——	——	4,556	15,598
Jack Waite	American Smelting and Refining Company	——	9,532	6,478[4]	7,253
Twin Buttes	Banner Mining Company			0	6,494
Plutus Mine	Chief Consolidated Mining Company	——	——	2,669	5,223
Rattlesnake Incline	Continental Uranium, Inc.	0	0	0	4,673
Jefferson	Minerva Oil Company	——	——	4,930	3,226
Crescent	Bunker Hill Company	0	0	10,681	2,411
Depression No. 6	Continental Uranium, Inc.	0	0	0	1,421
Eureka Hill	Chief Consolidated Mining Company	——	——	159	254
Balmat	St. Joseph Lead Company	——	551,320	539,530	N.A.[5]
Red ore	Tennessee Coal and Iron Division (U.S. Steel)	——	3,394,693	3,528,193	N.A.[5]
Zinc mines	Tennessee Coal and Iron Division (U.S. Steel)	——	245,870	388,570	N.A.[5]

1. Net tons. 2. Production cut by six weeks strike. 3. Net weight. 4. Production cut by five months strike. 5. N.A. Not available. 6. Development only.

the same tonnage. Over 7,000,000,000 gallons of gas-laden water was pumped from the Osceola Lode to put the mines back into production, in one of the greatest mine-unwatering projects in history.

Zinc-lead producers in the Wisconsin section of the Upper Mississippi Valley were active last year. Principal operators were Eagle Picher Company; American Zinc, Lead & Smelting Company; Piquette Mining & Milling Company; Ivy Construction Company; Murray and Richards;

Montana Production of Metals and Minerals From 1941 Through 1956. Dollar Values Shown For Base Metals Only

Year	Tungsten Conc. 60%WO_3 Tons	Manganese* 35% or More Mn Tons	Chromite* Tons	Fluorspar Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	7	43,555	—	—	246,475	12,386,925	128,036	21,259	60,710	$59,181,627
1942	—	120,409	65,238	—	146,892	11,188,118	141,194	20,050	54,715	60,129,853
1943	1	130,789	75,691	—	59,586	8,450,370	134,525	16,324	37,606	53,642,658
1944	25	153,665	1,251	—	50,021	7,093,215	118,190	13,105	36,127	49,039,855
1945	—	143,888	—	—	44,597	5,942,070	88,506	9,999	17,403	35,405,505
1946	84	129,227	—	—	70,507	3,273,140	58,481	8,280	16,770	29,957,206
1947	4	123,490	—	—	90,124	6,326,190	57,900	16,108	45,679	48,890,964
1948	—	119,339	—	318	73,091	6,930,716	58,252	18,411	59,095	56,422,609
1949	9	107,399	—	422	52,274	6,327,025	56,611	17,996	54,195	49,003,447
1950	—	119,694	—	41	51,764	6,590,747	54,478	19,617	67,678	54,956,689
1951	—	91,080	—	—	30,502	6,393,768	57,406	21,302	75,888	73,149,813
1952	1	90,772	—	16,160	24,161	6,138,185	61,948	21,279	82,185	70,521,092
1953	14	113,429	26,089	5,932	24,768	6,690,000	77,617	19,949	80,271	75,162,000
1954	678	NA	NA	15,102	23,660	5,177,942	59,349	14,820	60,952	57,756,621
1955	1,211	106,026	118,703	25,223	28,123	6,080,390	81,542	17,028	68,588	89,264,689
1956[1]	NA	80,636	121,000	60,000	33,020	6,470,940	96,898	18,610	71,865	113,571,501

1. Estimated by U.S. Bureau of Mines. * Gross weight. NA—Not available.

and H. Turner & Son. American Zinc, Lead now operates the Piquette mine as a joint venture, and ore reserves were extended during 1956. The company also placed the Temperly mine at Cuba City, Wisconsin in production in August 1956.

Montana

● Butte Takes On a New Look With the Berkeley Open Pit; Other Mine Expansions Slated

The value of minerals produced in Montana during 1956 reached an all-time high of $201,900,000. Mineral wealth produced during this past year exceeded the 1955 figures by almost 20 percent. A glance at the production table of minerals and metals produced in Montana will show substantial production increases over 1955 of copper, zinc, fluorspar, gold, lead, and silver. The production of chromite was slightly increased over the 1955 figures; however, manganese ores showed production declines.

The main producer of metallic wealth in Montana, the Butte district, once again worked throughout the year uninterrupted by strikes or major shutdowns. The high price for copper in the early part of the year saw practically all of the major, deep-level mines of the Anaconda Company in partial or full production. However, during the latter part of 1956, the Belmont, Stewart, and Original copper mines were closed down. Most of the other copper mines worked throughout the year.

The Kelley mine, the Greater-Butte block caving project of Anaconda, maintained anticipated tonnage throughout the year. The Berkeley open-pit project progressed throughout the year with a daily tonnage production of approximately 5,000 tons at the year's end. A great deal of waste was stripped at the pit during 1956.

Preliminary work on the Northwest project of the Anaconda Company was started during 1956. The headframe and some surface buildings were erected at the Missoula Gulch shaft site, while ground leveling and other preliminary work was accomplished at Ryan shaft site. These new shafts are to serve the anticipated deep level workings of the Mt. Con, Anselmo, and Lexington mines. The Ryan is to be a large hoisting shaft similar to the Kelley shaft, while the Missoula Gulch shaft will be a service shaft. Sinking at the Ryan is expected to begin about midyear and reportedly an Eimco 630 will be used for mucking.

Further developments in the Butte district by Anaconda include the East project, an underground exploration project in the vicinity east of the Berkeley pit and under the alluvial covered valley; and the Continental project, a drilling and exploration program to test the feasibility of another open-pit project on the east ridge.

Gold production increased during 1956 with several mines producing; however, the bulk of the gold production still comes from the ores produced in the Butte district. E. T. Vincent and Clay Lewis with their dragline, dry-land dredge near Superior, Montana, and the Montana Gold and Chemical Company are the state's leading producers of placer gold. In lode mines, the significant new producers were the Basin-Jib Gold Mines Inc. at Basin, and the White Development Company's Golden Sunlight Mine near Whitehall, Montana. Ore from the Basin-Jib mine, now shut down, was milled by selective flotation at the mill just out of Basin. Ore from the Golden Sunlight mine was first screened to minus 1/4-inch mesh and then sent to a cyanide mill on the property. Other mines active in gold production were the Morning Glory Mine, Lincoln County; Golden Anchor Mining and Milling Company, near Elliston; and the Montana Mining and Milling Company, with its mine in Lewis and Clark County.

Lead and zinc production increased, due primarily to the increased production of mines in the Butte district. However, new developments in the state which may increase production of these metals are: (1) the St. Paul Lead Company and Merger Mines Inc. are doing some exploration work on the Snowshoe mine near Libby; (2) the Silver Star Mines Inc. and the Oro Syndicate are developing the St. Paul lead-zinc mine near Troy; (3) and the Uranium Corporation of America is developing the Daly property near Wickes. The Jack Waite Mine on the western border of Montana resumed production in early 1956 after a prolonged strike.

Tungsten production declined somewhat, due primarily to the fact that the limit of the Government's tungsten purchase program was temporarily reached at midyear. The major tungsten producer in Montana was the Minerals Engineering Company from its Ivanhoe property in Beaverhead County. This company has developed a new open-pit tungsten property near Wise River, known as the Red Buttons, which promises to become a substantial producer.

The J. R. Simplot Company of Idaho started a large open-strip phosphate operation near Monida. Most of the uranium activity in the state is now located in the Pryor Mountain area south of Billings. Some of the mines are producing small amounts of high-grade ore.

Nevada Production of Metals From 1941 Through 1956. Dollar Value Shown For Base Metals Only

Year	Iron Ore Long Tons	Manganese 35% or More Mn Tons	Tungsten 60 Percent WO_3 Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	241	2,937	2,289	366,403	5,830,238	78,911	9,623	15,129	$38,959,420
1942	—	6,112	3,052	295,112	3,723,435	83,663	5,378	10,197	35,840,168
1943	7,368	10,451	2,910	144,442	1,620,280	71,068	4,790	13,647	28,351,601
1944	36,581	19,800	2,665	119,056	1,259,636	61,232	6,605	20,699	27,371,513
1945	6,196	874	1,857	92,265	1,043,380	52,595	6,275	21,457	24,186,294
1946	3,299	1,067	2,617	90,680	1,250,651	48,616	7,175	22,649	27,026,416
1947	5,452	67	2,002	89,063	1,337,579	49,603	7,161	16,970	31,366,282
1948	8,945	—	949	111,532	1,790,020	45,242	9,777	20,288	34,055,480
1949	3,094	—	740	130,399	1,800,209	38,058	10,626	20,443	29,615,777
1950	5,465	—	1,123	178,447	1,537,217	52,569	9,408	21,606	38,181,872
1951	331,327	58	1,482	121,036	981,669	56,474	7,148	17,443	41,280,596
1952	912,084	105	2,329	117,203	941,195	57,537	6,790	15,357	40,086,746
1953	444,081	20,510*	3,233	101,799	697,086	61,850	4,371	5,812	42,177,725
1954	351,250	88,220*	4,696	79,067	560,182	70,217	3,041	1,035	45,759,162
1955	324,602	102,000*	6,155	72,913	845,397	78,925	3,291	2,670	63,832,670
1956[1]	860,700	105,000*	4,800	68,600	950,000	82,500	6,000	6,900	76,179,000

1. Estimated by U.S. Bureau of Mines. * Long tons; 1956 data for manganese reported by F. A. McGonigle at Colorado Mining Convention February 8, 1957, and includes output of metallurgical grade nodules from Three Kids operation only.

Nevada

● Mine Output Was Greatest In History; Kennecott Closes The Kimbley Open-Pit Mine

Spurred by copper, the value of Nevada's 1956 output of metal ores and minerals was the greatest in the history of the state at $124,283,000. Metal ores accounted for $107,890,000, and nonmetallics, $16,393,000. Copper production, originating largely at Consolidated Coppermines Corporation and Kennecott Copper Corporation at Ely, Nevada, and The Anaconda Company at Weed Heights, Nevada, increased from 78,925 to an estimated 82,500 tons. The average price of $0.40 for the year boosted the value of copper production $10,000,000 above the 1955 figure bringing the 1956 total to $69,135,000.

The output of iron more than doubled; the value of iron ore shipments was greater than 2½ times the total posted in 1955. Most of the iron ore produced is shipped to Japan. One producer, Standard Slag Company, is reported to have started construction of a magnetic concentrator near Wabuska with a capacity of 175 tons per hour. Lead and zinc mining posted reasonably good gains following the low ebb of activities in 1955. Recoverable lead content of ores mined last year in Nevada showed an 82 percent increase over 1955; similarly, recoverable zinc content of ores mined in 1956 was 2.6 times the previous year.

The United States Bureau of Mines reports that Nevada led the nation in manganese production and ranked second, behind California, in output of mercury with 5,800 flasks (76 pounds). In the tungsten industry the picture is cloudy. Nevada is the biggest producer of tungsten ores in the United States, but production dropped 22 percent to 4,800 tons (60 percent WO_3 basis) in 1956. Though an interim tungsten purchase program based on a quota of 1,250,000 ton-units was authorized, Congress appropriated only $21,000,000 of the required $91,000,000 total needed to continue the program. The appropriation was exhausted in November 1956. Many tungsten operators drastically curtailed operations; some closed; and others, mainly the large producers, stockpiled concentrates while they waited for Congressional approval of additional funds.

Significant events at Nevada Mines Division of Kennecott Copper Corporation, near Ely, Nevada, was the depletion of the Kimbley open pit, and Kennecott closed the operation December 31, 1956. Development of the company's new Veteran open pit is progressing rapidly with approximately three tons of waste being removed for each ton of ore made available to the shovels. Underground operations continued at the Minnesota Hi orebody, lying above and south of the Deep Ruth ore body which is slated for block caving. It is expected that the Minnesota Hi will be exhausted in 1957 after which it will be possible to start mining the Deep Ruth. Last year Kennecott established a peace-time production high of 20,941 tons of ore (16 pounds of copper per ton) per operating day.

Consolidated Coppermines Corporation, also near Ely, Nevada, produced approximately 2,600,000 tons of sulphide ore at the Tripp open pit last year. In addition Coppermines shipped 234,800 tons of ore from its portion of the Liberty

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open pit and 284,500 tons from their portion of the Veteran pit; both are worked for Coppermines account by Kennecott.

Near Yerington, The Anaconda Company at Weed Heights treated about 4,500,000 tons of copper oxide ore averaging 0.83 percent. Last year, blasting costs at the company's open pit were reduced by using fertilizer-grade amonium nitrate treated with Diesel oil.

A research program for milling gold sulphide ore underway at Getchell Mine, Inc. was successfully terminated last year. It has been reported that the procedure developed be adopted whenever Getchell feels that it is expedient to resume gold mining. Getchell currently is one of the largest tungsten producers in the state and curtailed gold operations during 1951 to concentrate on tungsten.

Renewed and expanded activities of Combined Metals Reduction Company in the Pioche district and Bristol Silver Mines Company contributed to the substantial increase in lead and zinc. Clark County again led the state in overall production of lead and zinc through ore drawn from the Metals Reserve Company stockpile at Jean, Nevada, and lead residues from manganese ore treated by Manganese, Inc. In Eureka County, Eureka Corporation completed some 5,000 feet of lateral work on the 850, 950, and 1,050 levels of the TL shaft. Underground diamond drilling totaled about 30,000 feet in addition.

Cordero Mining Company in Humboldt County, the state's largest mercury producer, started a new shaft by sinking and raising from the 700-foot level. It is expected that the shaft work will be completed sometime in 1957. Manganese, Inc. near Henderson, Nevada mined, concentrated, and nodulized an average of 1,100 tons of crude manganese ore per day. Present production is at the rate of 100,000 long dry tons of metallurgical grade manganese of 35 percent or better manganese.

New Mexico

● Ambrosia Lake Ore Reserves Highlight 1956; Zinc Stages A Comeback During The Year

Continued drilling activities with consequent delineation of multi-million-ton uranium ore bodies at Ambrosia Lake highlighted the news in New Maxico last year. But record breaking activities weren't confined to uranium alone. The value of the state's 1956 production of minerals (excluding uranium) soared to an all-time high of $480,823,000. Of this total, metals accounted for approximately 16 percent and non metals 17 percent. Mineral fuels made up the remaining two-thirds of the output value. Important gains in production were registered by copper, lead, zinc, and potash. In fact shipments of potash climbed to 1,906,000 tons (K_2O equivalent) valued at $71,100,000, the highest in the state's history, though this represented only a slight increase over 1955.

There was little doubt, however, that uranium was very much in the spotlight. In November 1956 the Atomic Energy Commission estimated that a little over two-thirds of the known and inferred uranium ore reserves in the United States existed in New Mexico, largely in the Ambrosia Lake and the Jackpile districts.

New Mexico Production of Potash, Gold, Silver, Copper, Lead, and Zinc and Dollar Value from 1941 Through 1956 For Base Metals Only

Year	Potassium Salts K_2O Equivalent Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	433,677	27,845	1,328,317	73,478	4,668	37,862	$25,471,416
1942	548,730	11,961	676,170	80,100	4,608	46,461	29,542,885
1943	604,414	5,563	463,583	76,163	5,723	59,524	34,042,378
1944	679,721	6,918	535,275	69,730	7,265	50,727	32,178,026
1945	733,176	5,604	465,127	56,571	7,662	40,295	26,386,781
1946	789,473	4,009	338,000	50,191	4,899	36,103	26,552,417
1947	880,605	3,146	515,833	60,205	6,383	44,103	38,374,269
1948	967,945	3,414	537,674	74,687	7,653	41,502	46,799,576
1949	932,497	3,249	380,855	55,388	4,652	29,346	31,029,120
1950	1,072,772	3,414	338,581	66,300	4,150	29,263	37,437,915
1951	1,217,617	3,959	443,267	73,558	5,846	45,419	54,697,048
1952	1,411,125	2,949	479,318	76,112	7,021	50,975	56,559,692
1953	1,562,831	2,614	205,000	72,477	2,943	13,373	45,725,959
1954	1,732,240	3,539	109,132	60,558	887	6	36,196,189
1955	1,826,118	1,917	251,072	66,417	3,296	15,277	54,581,760
1956[1]	1,906,000	3,460	397,000	72,800	5,900	35,200	72,878,805

1. Estimated by U.S. Bureau of Mines.

Production from Ambrosia Lake was limited to the output obtained from the Dysart shaft of Rio de Oro Uranium Mines, Inc., first to get into production in the area. For others, 1956 was largely a year of outlining ore deposits and planning for shafts which were collared late in the year. Next to get into production will be Kermac Nuclear Fuels, Inc. with two shafts. Other shafts underway included Holly Minerals Corporation, Homestake-New Mexico Partners, and Phillips Petroleum Company at Ambrosia Lake.

The Anaconda Company placed the new sandstone section of the Bluewater uranium plant in operation in January 1956 on a size-scale never before attempted by anyone. Total milling capacity of the plant is now given by the AEC as 3,000 tons per day. Also during the year, the Shiprock mill of Kerr McGee Oil Industries, Inc. was enlarged to 500 tons daily and a liquid-liquid extraction process installed. Kerr McGee was the first plant to apply the liquid-liquid process to the extraction of vanandium from uranium ore, and the second United States operator on the Colorado Plateau to utilize the method for recovering uranium. Satisfactory negotiations were completed for one new mill in the Grants area, a 1,500-ton unit, by Homestake-New Mexico Partners. At year's end negotiations were underway for three additional uranium plants; one, a 1,500-ton-daily facilities by Homestake-Sabre-Pinion Partners; the second, 3,000-a ton-daily mill by Kermac Nuclear Fuels Company; and the third, a 750-ton plant by Phillipps Petroleum Company.

Output of copper increased about 9 percent last year compared with 1955; with higher averages prices prevailing throughout the year, the value of New Mexico's output of the red metal jumped 23 percent. Chino Mines Division of Kennecott Copper Corporation was the major producer. Cyclone development tailored for specific jobs in the mill continued at Chino.

The five producing potash companies near Carlsbad continued to expand and improve operating techniques. A sixth company, National Potash Company, situated 30 miles east of Carlsbad, started production early in February 1957. Construction is also scheduled to start on a seventh plant; Farm Chemical Resources Development Corporation will spend approximately $15,000,000 to bring this latter facility into production. United States Potash Company, during the year, merged with Pacific Coast Borax Company with the new combine known as United States Borax & Chemical Corporation. United States Potash Division completed a $3,000,000 expansion program at the mine and refinery designed to increase productive capacity by 20 percent. It was reported that USP plans to mine the northern ore body using continuous miners with belt conveyor transport of ore to recently completed shaft hoisting facilities located six miles north of the original shaft. Potash Company of America continued to pioneer continuous mining methods using a company developed potash-miner.

Lead production was up 79 percent last year to 5,900 tons. Increased output resulted from reopening of several mines. American Smelting & Refining Company's Ground Hog unit completed a full year ot operation following its reopening in March of 1955; other mines reopened in late 1955 or early 1956, including the Hanover mine (New Jersey Zinc Company), the Kearney mine (New Mexico Consolidated Mining Company), and the Bayard group (United States Smelting, Refining & Mining Company). The activities of the above mines also accounted for greatly expanded zinc output. Estimated zinc production for 1956 stood at 35,200 tons compared to 15,277 tons in 1955.

Oregon

● Riddle Nickel Output Is Nearly Doubled; Wah Chang Studies Zirconium Processes

Large production increases in nickel, chromite, mercury, gold, and uranium helped boost the value of Oregon's 1956 mineral output to a record figure of approximately $35,000,000. This was a 10 percent gain over 1955.

Hanna Coal and Ore Corporation nearly doubled output of nickel ore from Nickel Mountain, Douglas County. Production was more than 500,000 tons. The smelter at Riddle, operated by Hanna Nickel Smelting Company, turned out nearly 23,000,000 pounds of ferro-nickel averaging nearly 46 percent nickel.

Chromite production was up 56 percent to 8,330 short, wet-tons valued at $709,000. Pacific Northwest Alloys, Inc. completed upgrading of low-grade chromite concentrates stockpiled by the government near Coquille in World War II and shipped output to its Mead, Washington, ferrochrome plant.

Mercury output jumped 78 percent to 1,875 flasks worth $487,500. The Bonanza Oil & Mine Corporation, Douglas County, and the Horse Heaven mine of Cordero Mining Company in Jefferson County were principal producers.

Although gold production was up 45 percent, the 2,480-ounce output was the fourth lowest in the last 28 years. Boaz Mining Company's Buffalo mine, Grant County, accounted for nearly three-fourths of the output. Sunshine Mining Company, large Idaho silver producer, did some investigative work in the old gold camp of Bourne, Grant County, but then dropped lease-and-options on five properties.

Lakeview Mining Company shipped 400 tons of uranium ore from its White King mine, Lake County, to a Salt Lake processing plant, compared with about 300 tons in 1955; Lakeview also started a 300-foot, two-compartment shaft. Fewer uranium prospectors were active during the year.

Oregon Metallurgical Corporation started production of titanium ingots from titanium sponge metal in a new plant at Albany. Wah Chang Corporation began construction of an Albany plant to produce zirconium and titanium metal. It also produced zirconium and hafnium sponge for the Atomic Energy Commission at AEC facilities in Albany formerly operated by the United States Bureau of Mines.

Oregon Production of Nickel, Mercury, Chromite, Gold and Silver. Dollar Value of Gold and Silver Output Given for 1941 Through 1956.

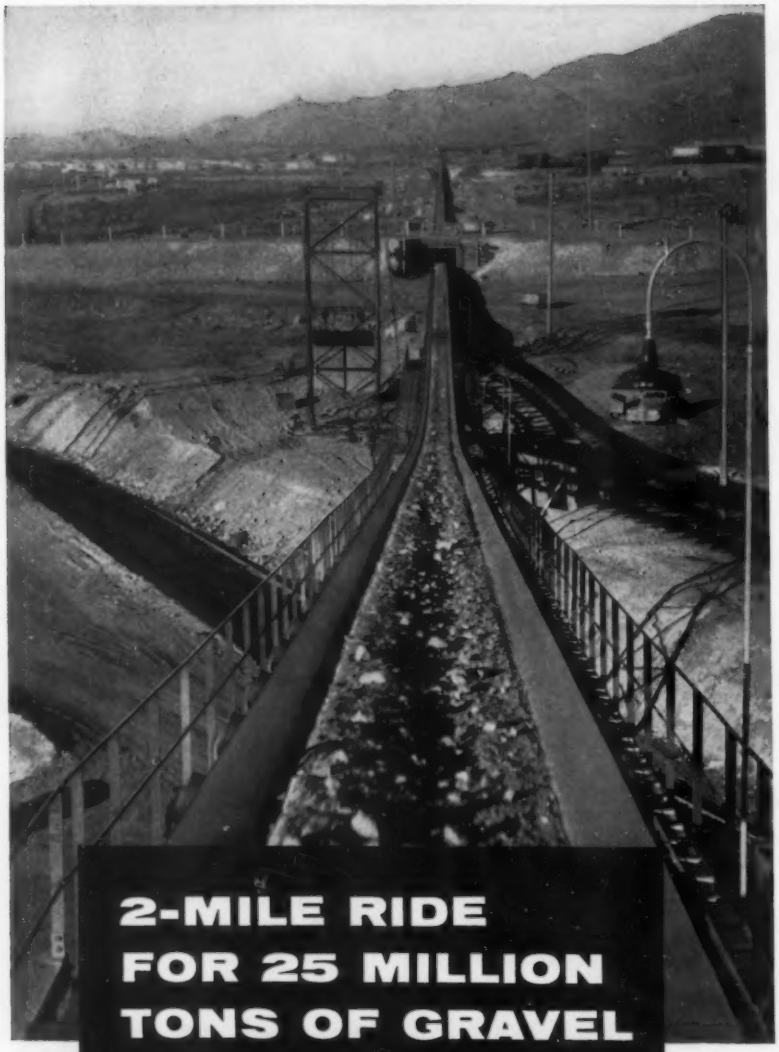
Year	Nickel Tons	Mercury Flasks	Chromite Tons	Gold Ounces	Silver Ounces	Dollar Value
1941		9,032	840	96,525	276,158	$3,576,154
1942		6,936	2,683	46,233	87,376	1,680,289
1943		4,651	16,363	1,097	10,527	45,878
1944		3,159	7,818	1,369	20,243	62,310
1945		2,500	4,366	4,467	10,461	163,874
1946		1,326	NA	17,598	6,927	621,527
1947		1,185	—	18,979	30,379	691,758
1948		1,351	3,345	14,611	13,596	523,690
1949		1,167	—	16,226	12,195	578,947
1950		5	—	11,058	13,565	399,307
1951		1,177	754	7,927	6,218	283,073
1952		868	6,591	5,509	4,037	196,469
1953		648	6,216	8,250	6,930	295,022
1954	1,993	491	6,665	6,520	14,335	241,174
1955	4,181	1,056	5,341	1,708	8,815	67,758
1956[1]	7,650	1,875	8,330	2,480	11,760	97,443

1. Estimated by U.S. Bureau of Mines. NA—Not available.

South Dakota

● New Uranium Mill Opened At Edgemont; Deep Development Underway at Homestake

The value of all minerals produced in South Dakota during 1956, excluding uranium, reached $45,405,000 compared to the 1955 figure of $40,809,000.



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INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

Gold and silver, responsible for almost 45 percent of total mineral value, came from the operations of Homestake Mining Company and Bald Mountain Mining Company in Lawrence County, the major gold-producing district in the United States. Gold production was up eight percent over 1955 and amounted to 573,700 ounces, and silver totaled 138,600 ounces, a decrease of 10 percent. Early in the year Homestake put its fourth ball mill unit in operation, which provided for the treatment of an additional 77,603 tons of ore and brought total mill production to 1,627,719 tons for the year. A year's end estimate of ore reserves at the Homestake mine showed 15,218,000 tons available for mining above the 5,000-foot level. Two deeper levels are being driven from the new shaft below the 5,000-foot level.

An ore discovery was made at the Taylor property of the Edgemont Mining & Uranium Corporation, the state's chief producer of uranium ore. The company also operated the Gould and Freezeout properties. Mines Development, Inc. completed a purchase contract with the Atomic Energy Commission and finished construction of a 300-ton-per-day ore-processing mill at Edgemont which started operation in July 1956. It is the first uranium-milling plant erected outside the Colorado Plateau area. Mines Development had assumed operation of the ore buying station at Edgemont. During 1956 a Defense Minerals Exploration Administration contract was approved for the exploration of Uranium Research & Development Company's Teepee prospect. McCloud Development Company reported a discovery of carnotite ore northeast of Edgemont. The Phillips mine was operated by the Sodak Uranium & Mining Company.

Lithium production declined sharply, chiefly because the mines and flotation mill owned by the Lithium Corporation of America, Inc., where operations resumed in March 1955, were closed early in 1956 and placed on a stand-by basis. The company had ample sources of lithium ores closer to points of consumption. The Midwest Lithium Corporation was formed late in 1955 and acquired the properties of National Processing Company, including the old United States Gypsum Company plant at Piedmont. The plant was remodeled and expanded. Uranium & Allied Metals Company took over the cyanide plant at Keystone from the Holy Terror Mining Company and flotation concentrates from spodumene ore were obtained from the Dyke Lode. Maywood Chemical Works operated the Etta mine at Keystone and shipped spodumene to Maywood, New Jersey for processing.

The Consolidated Feldspar Department of International Minerals & Chemical Corporation operated its feldspar mines in Custer and Pennington Counties and also purchased ore from several independent operators for its grinding plants at Custer and Keystone.

Southeastern

● Copper Developed in North Carolina; Florida Ilmenite Producers Have Big Year

In North Carolina, Appalachian Sulphides, Inc., a subsidiary of Nipissing

South Dakota Production of Gold, Silver, Feldspar, and Beryllium from 1941 Through 1955. Dollar Value for Gold and Silver only.

Year	Feldspar (Crude) Long Tons	Beryllium Conc. Tons	Gold Ounces	Silver Ounces	Dollar Value
1941	59,015	151	600,637	170,771	$21,143,732
1942	56,449	205	522,098	186,937	18,406,363
1943	70,913	238	106,444	35,886	3,751,059
1944	64,806	306	11,621	5,445	410,607
1945	68,374	38	55,948	26,564	1,977,070
1946	74,540	95	312,247	86,901	10,998,861
1947	58,959	70	407,194	111,684	14,359,766
1948	54,037	45	377,850	94,693	13,323,894
1949	32,272	69	464,650	109,383	16,363,011
1950	43,875	96	567,996	142,069	20,008,436
1951	48,559	138	458,101	139,590	16,159,871
1952	40,163	334	482,534	132,102	17,008,249
1953	50,601	392	534,987	138,642	18,850,023
1954	44,498	337	541,445	151,407	19,087,606
1955	42,164	294	529,865	154,092	19,109,068
1956[1]	46,000	120	573,700	138,600	20,558,500

1. Estimated by U.S. Bureau of Mines.

Mines Company Ltd., completed shaft sinking at the Ore Knob property in Ashe County and started underground development work on the copper ore body. Construction of a 700-ton-per-day flotation mill started in June 1956, and was completed early this year. The mine is being developed on three levels, and it was reported that drifting on the 700-foot level indicated ore showings somewhat better than earlier drill results.

Tungsten production in North Carolina increased 9 percent in tonnage during 1956. Tungsten Mining Corporation of Henderson reported a total output of 165,393 units for the fiscal year ended August 31, 1956. This was the greatest production in the company's history. Tungsten Mining mined and milled 333,000 tons of ore during the fiscal year and increased ore reserves by 577,000 tons. In August 1956 reserves amounted to 1,453,000 tons.

North Carolina Production of Feldspar and Tungsten From 1950 through 1956

Year	Feldspar Long Tons	Tungsten Conc. (60% WO_3) Tons
1950	183,027	1,088
1951	166,361	1,041
1952	240,364	1,254
1953	268,062	2,074
1954	230,744	2,538
1955	242,724	2,609
1956[1]	249,000	2,836

1. Preliminary estimate U.S. Bureau of Mines.

Foote Mineral Company spent over $500,000 on improvements and additions to the spodumene plant at Kings Mountain, North Carolina. Improvements in processing equipment were expected to increase operating efficiency, but will not materially affect the total plant capacity. Another company, Basic Atomics, Inc., reportedly did some drilling in the Kings Mountain area.

Titanium concentrates (ilmenite and rutile) were added to South Carolina's mineral production last year. Marine Minerals, Inc., began shipments from a new plant near Aiken, South Carolina. It was disclosed in September 1956 that American Cyanamid Company would double the 36,000-ton-per-year titanium dioxide capacity of its Savannah, Georgia plant by early 1958. In Florida, Hobart Brothers Company reportedly developed a giant, bucket-type dredge for mining titanium-bearing minerals. The new dredge will handle enough sand to produce 200 tons of concentrate per week. The suction dredge which was long used by Hobart Brothers handled only about half this amount.

Elsewhere in Florida, Humphreys Gold Corporation placed the Highland ilmenite mining and treatment facilities on a seven day work week. Humphreys operates the Highland and Trail Ridge ilmenite processing plants for E. I. du-Pont de Nemours & Company. It was reported that Heavy Minerals Company is developing a mining operation for beach sands along the Gulf Coast of Florida between Panama City and Pensacola. A separation plant was planned for Panama City.

Ilmenite production in Florida was almost double the 1955 recorded output, and rutile output increased 16 percent in tonnage and 26 percent in value. Zirconium concentrate production was up more than 50 percent; garnet production was up 10 percent.

Marketable production of phosphate rock from Florida increased 20 percent in tonnage and 23 percent in value during 1956. The 1956 phosphate rock total reached 10,500,000 tons (about 80 percent of the United States total) valued at $65,920,000.

Developments in the phosphate field include several plant expansions and improvements. American Cyanamid Company announced its intention of building a 200,000-ton-per-year triple superphosphate plant at Brewster, Florida on an existing company site where phosphate rock is mined. Erection of the plant, designed by Chemical Construction Company in collaboration with Dorr-Oliver, Inc., has been started. Completion is scheduled for the middle of 1957. American Cyanamid also constructed a new washing plant near Lakeland, Florida to treat production from the company's Orange Park mine. The Saddle Creek operation of Cyanamid was depleted during 1956.

Florida Production of Phosphate Rock, and Titaniferous Minerals (ilmenite, rutile and zircon) From 1950 through 1956

Year	Phosphate Rock Long Tons	Titanium Minerals Tons
1950	8,085,870	(2)
1951	8,496,831	(2)
1952	8,781,125	(2)
1953	9,331,002	178,818
1954	10,437,197	182,421
1955	8,747,282	238,500
1956[1]	10,500,000	(3)

1. Preliminary estimate of U.S. Bureau of Mines.
2. Production figures unavailable.
3. 1956 figure unavailable.

Late in 1956, it was reported that Kaiser Aluminum & Chemical Corpora-

Tennessee Production of Phosphate Rock, Gold, Silver, Copper, Lead, Zinc and Dollar Value from 1950 Through 1956

Year	Phosphate Rock Long Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1950	1,384,473	160	39,958	6,851	113	35,326	$22,983,278
1951	1,419,892	108	24,960	7,069	14	38,639	28,121,844
1952	1,452,508	241	57,569	7,620	18	38,020	27,267,054
1953	1,622,170	293	68,935	7,829	9	38,465	25,666,924
1954	1,633,226	218	60,759	9,087		30,326	22,716,838
1955	1,465,902	221	66,619	9,911		40,216	27,881,089
1956[1]	1,647,000	190	62,900	10,700		45,188	32,439,550

1. Estimated by U.S. Bureau of Mines.

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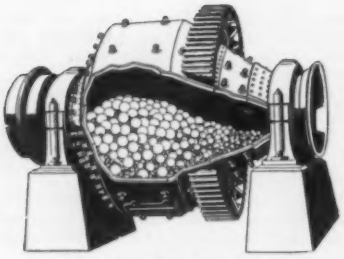
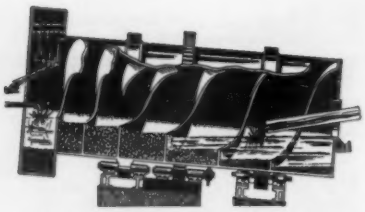
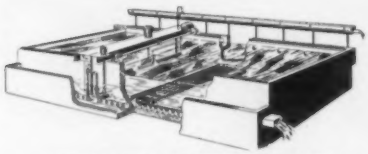


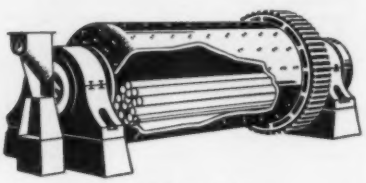
CONICAL MILLS



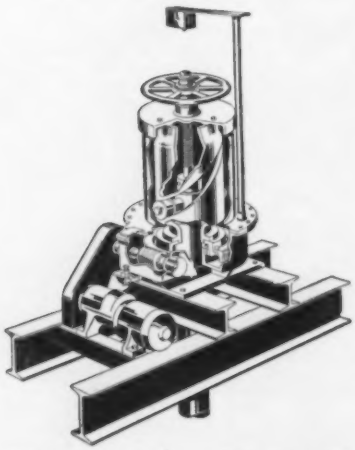
COUNTER-CURRENT CLASSIFIERS
HEAVY-MEDIA SEPARATORS



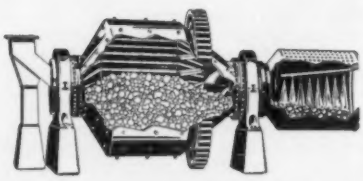
AUTOMATIC BACKWASH SAND FILTERS



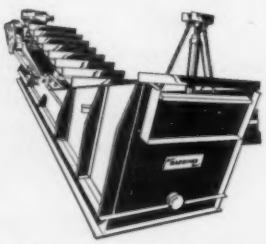
ROD MILLS



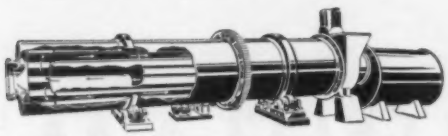
"AUTO-RAISE" THICKENER MECHANISMS



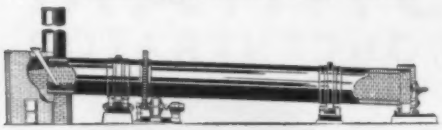
CONICAL ORE SCRUBBERS



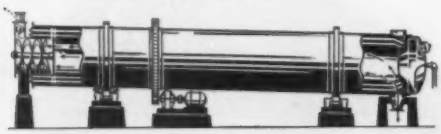
OVERDRAIN CLASSIFIERS



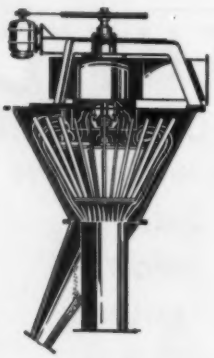
DOUBLE-SHELL, SEMI-DIRECT COAL DRYERS



HORIZONTAL ROTARY KILNS



STEAM-TUBE ROTARY DRYERS



"GYROTOR"
AIR CLASSIFIERS

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tion would build a pilot on the Nickols property of Virginia-Carolina Chemical Company plant to determine what minerals could profitably be extracted from phosphate waste. International Minerals & Chemical Corporation undertook an expansion of sulphuric acid production facilities at the Bonnie chemical plant at Bartow, Florida. The new facilities doubled the acid capacity which will result in greater output of dicalcium phosphate at the Bonnie plant.

Tennessee

● New Jersey Zinc Readies Another Producer; Phosphate Production at All-Time High

Activity in mining for most metalliferous ores and important non-metallics remained at a high level in Tennessee last year. Significant production increases were registered for copper, zinc and phosphate rock. Copper output was up 8 percent over 1955 to a total of 10,700 tons according to preliminary estimates by the United States Bureau of Mines. Zinc producers could boast an even greater increase. Last year zinc production registered a 12 percent gain and reached 45,188 tons. Production of 1,677,000 long tons of phosphate rock was enough to establish a new all-time Tennessee record. This figure represented a 12 percent increase over 1955. Shipments of metallurgical grade manganese ore during 1956 were 7 percent higher than in 1955. Total production of metallurgical grade manganese was 17,024 tons. Iron ore shipments, however, were off 18 percent from the 1955 level.

American Zinc Company continued an active exploration program for zinc ore in Jefferson and Knox Counties. The company started drilling the Strawberry Plains area, across the river from its Mascot property under a $768,000 DMEA contract. The contract covers 335,000 feet of diamond drilling which is to be completed by September 1958. Drilling on another DMEA contract in the Southwest New Market area was completed in October 1956. Rough calculations set the reserves in this area at 26,000,000 tons of zinc ore contained in 4 zones. Difficulties in obtaining electrical equipment delayed the opening of American Zinc's Coy shaft near Jefferson City.

Production of copper, sulphuric acid and iron sinter at Tennessee Copper Company was at a record high last year. In order to achieve greater economies in milling, a major construction program was undertaken in 1956 to consolidate all flotation operations at the London mill of Tennessee Copper. The mining of recoverable ore from the company's Eureka ore-body is nearing completion. Another project underway at Tennessee Copper is the sinking of a hoisting shaft and installation of facilities for railroad car loading of ore at the Calloway mine. Ore from the Calloway mine will be hoisted through the new shaft and hauled over the company railroad to the London mill. Construction of the Copperhill sodium hydrosulfite and by-product zinc oxide plant was completed last year and the facility was started in September.

During the year New Jersey Zinc Company placed a new, 1,000-ton-per-day zinc mine in operation near Jefferson

City. Construction of the 1,000 ton mill was completed in August 1956. Mine development of the ore body, containing disseminated zinc in flat dipping dolomites, was begun in 1953. The underground operation is mechanized with tractor-mounted, 3-drill jumbos and Gismos for mucking. New Jersey Zinc also started shaft sinking operations at the Flat Gap property near Treadway, and initial production is expected late this year. Planned daily production of the Flat Gap operation is 2,000-tons-per-day. The mine will be developed using a vertical shaft for hoisting, a second vertical shaft for ventilation and a truck-service, inclined tunnel.

In the phosphate field, International Minerals & Chemical Corporation completed construction of a washing plant at the Godwin holdings. The latter property was purchased from The Tennessee Valley Authority in 1955. Victor Chemical Works is planning to install another furnace to double production of elemental phosphorous.

During the year Republic Steel Corporation became an equal partner with the Carne Company in Cramet Inc., a titanium sponge metal producer with a plant at Chattanooga. Capacity of the plant is rated at 6,000 tons of titanium annually.

Tri-State

● Lead-Zinc Ore Production Slightly Under 1955 Figures; Kansas Registers Good Gain

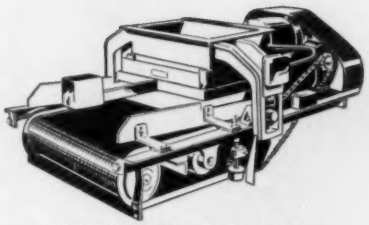
The estimated total value of 1956 metal-ore production in the states of Missouri, Kansas and Oklahoma was slightly greater in 1956 than for the previous year. These states include two major mining districts; the southeast Missouri District is reported in the Central section of this Yearbook. While this section is confined to the Tri-State District. Higher metal prices prevailing through 1956 were chiefly responsible for the increase; metal output from both Kansas and Missouri approximated that of 1955. Oklahoma, on the other hand, showed a significant decline in lead and zinc production.

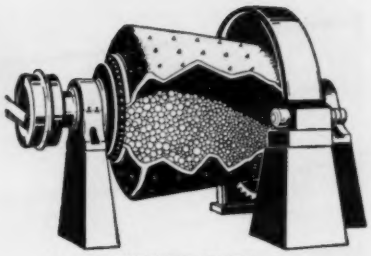
Kansas Production of Lead, and Zinc from 1941 Through 1956

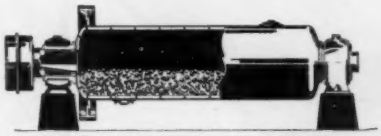
Year	*Lead Tons*	*Zinc Tons*
1941	14,538	71,403
1942	9,419	55,874
1943	9,213	56,944
1944	9,394	63,703
1945	7,370	48,394
1946	6,445	47,703
1947	7,285	41,497
1948	8,386	35,577
1949	9,772	29,433
1950	9,487	27,176
1951	8,947	28,904
1952	5,916	25,482
1953	3,347	15,515
1954	4,033	19,110
1955	5,498	27,611
1956[1]	7,100	27,200

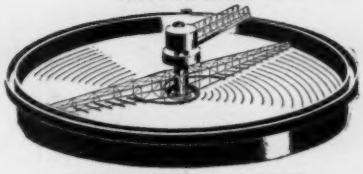
1. Preliminary estimate of U.S. Bureau of Mines.

Crude ore production of zinc and lead-zinc in the Tri-State District declined in 1956 compared with 1955; the drop resulted primarily from the reduced activity in Oklahoma. Kansas figures revealed a substantial increase in both lead and zinc production. Operations in the Southwest Missouri portion of the Tri-State District

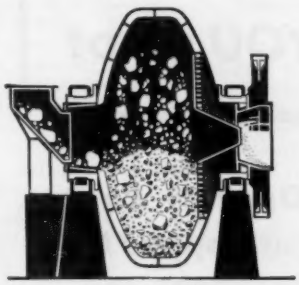

CONSTANT-WEIGHT FEEDERS

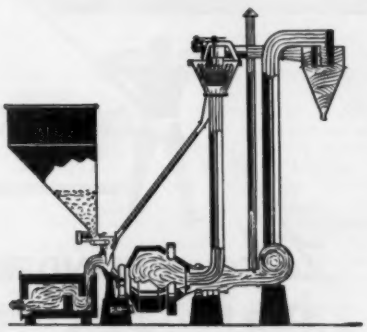

TRICONE MILLS

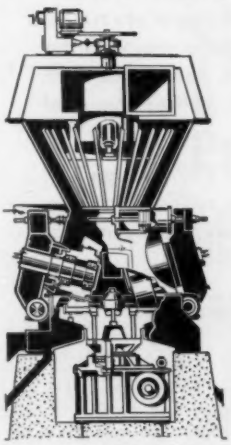

BALL AND PEBBLE TUBE MILLS

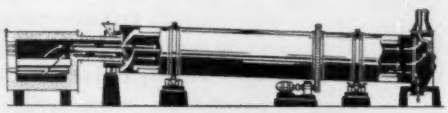

CENTER-PIER CLARIFIERS AND THICKENERS

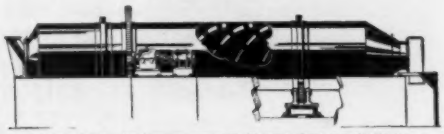
HYDRO-CLASSIFIERS

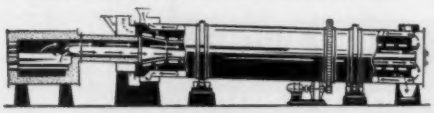

CASCADE MILLS


"GYROTOR" AIR CLASSIFYING SYSTEMS


DISC-ROLL MILLS


SINGLE-SHELL ORE AND CONCENTRATE ROTARY DRYERS


AIR AND WATER TYPE ROTARY COOLERS


DOUBLE-SHELL, INDIRECT-FIRED DRYERS AND HEATERS

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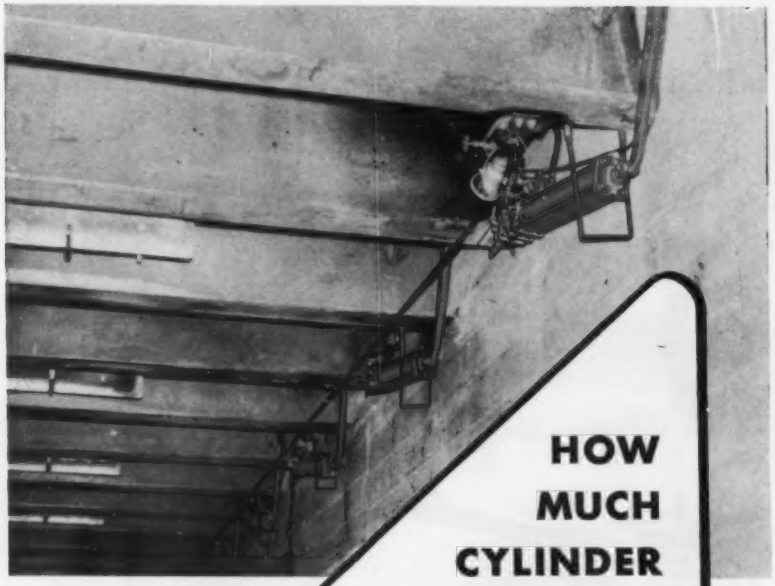

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These 4" dia., air-operated Ledeen Cylinders—remote-controlled by Ledeen Valves—speed the loading of ore trains. They combine the advantages of automatic control with the known dependability of Ledeen Cylinders. Because of their rugged construction, these cylinders will deliver years of trouble-free service.

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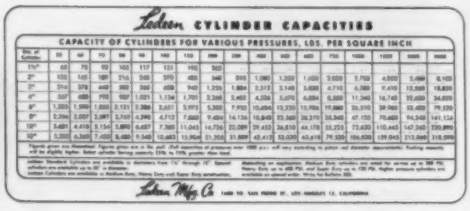
HOW MUCH CYLINDER POWER DO YOU NEED?



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remained at about the same level as 1955. Exploratory drilling increased in 1956 as several of the Tri-State operators made an effort to add to their ore reserves. Churn drilling has been reported in some mining areas which have been idle for a number of years.

Four mills processed practically all of the crude ore produced from The Tri-

Missouri Production of Lead, and Zinc, Copper, and Silver from 1941 Through 1956

Year	Lead Tons	Zinc Tons	Copper Tons	Silver Fine Ounces
1941	165,909	21,932	1,400	169,027
1942	199,548	36,394	1,300	69,106
1943	184,910	30,413	1,340	111,285
1944	174,683	36,626	3,302	92,243
1945	176,575	22,175	3,399	94,822
1946	139,112	22,234	1,857	69,401
1947	132,246	17,074	1,760	93,600
1948	102,288	6,463	2,370	114,187
1949	127,522	5,911	3,670	123,413
1950	134,626	8,189	2,282	236,273
1951	123,702	11,476	2,422	184,424
1952	129,245	13,986	2,656	517,432
1953	125,895	9,981	2,374	359,781
1954	125,250	5,210	1,925	352,971
1955	125,412	4,476	1,722	438,000
1956[1]	122,000	3,920	2,130	377,200

1. Preliminary 1956 estimate of U.S. Bureau of Mines.

State District. The Central mill of Eagle-Picher Company at Cardin, Oklahoma continued to be the largest plant in the district. The next in point of size was the Number 8 Ballard mill of National Lead Company at Baxter Springs, Kansas. The Barbara J mill of American Zinc, Lead & Smelting Company at Cardin, Oklahoma and the Dale mill of the Dale Mining Company at Stark City, Missouri were also major concentrators which operated last year. The Dale mill processed ore of the Big Four Mining Company until August when both the mine and the mill were shut down. Eagle-Picher's Central mill treated custom ore as well as company-mined ore. The Number 8 Ballard and the Barbara J mills handle company ore only. In January 1956 it was reported that the Nellie B operation of American Zinc, Lead & Smelting Company were being rapidly depleted.

Cadmium, germanium and indium were minor metals recovered as byproducts in the smelting of the zinc and lead-zinc ores of the Tri-State District.

Preliminary estimates of the recoverable lead and zinc production from the Tri-State District for 1956 were set at 19,900 tons of lead and 57,800 tons of zinc. Oklahoma and Kansas accounted for all the lead production and all but 640 tons of the zinc. Kansas lead output was estimated at 7,100 tons while Oklahoma accounted for 12,800 tons of lead. Similarly, Kansas zinc totaled 27,200 tons in 1955 compared to 29,960 tons of zinc reported from Oklahoma.

Oklahoma Production of Lead, and Zinc From 1941 Through 1956

Year	Lead Tons	Zinc Tons
1941	25,021	166,602
1942	22,806	146,510
1943	19,733	114,085
1944	13,944	91,449
1945	12,664	69,300
1946	13,697	69,552
1947	14,289	51,062
1948	16,918	43,821
1949	19,858	44,033
1950	20,724	46,739
1951	16,575	53,450
1952	15,137	54,916
1953	9,304	33,413
1954	14,204	43,171
1955	14,126	41,543
1956[1]	12,800	29,960

1. Preliminary estimate U.S. Bureau of Mines.

Utah

● Uranium Reduction Starts New Mill; Kennecott Driving Haulage Tunnel at Bingham

Mineral production in Utah reached a record $369,647,000 (excluding uranium) during 1956 with metals accounting for 80 percent of the total value. This represented an 11 percent advance from the output established in 1955 of $331,845,000. Of the total output value, the following metal ores contributed as follows: copper 56 percent, iron ore 7 percent, lead 4 percent, gold 4 percent, zinc 3 percent, silver 2 percent, and other metals 4 percent.

Important new plant facilities included the completion and start-up of the 1,500-ton-per-day uranium plant of Uranium Reduction Company. Texas Zinc Minerals also started construction of a 775-ton uranium plant at Mexican Hat to treat ore from the Happy Jack mine. During 1956, the Garfield Chemical & Manufacturing Corporation, a jointly owned facility of American Smelting & Refining Company and Kennecott Copper Corporation, expanded production of sulphuric acid to 1,100 tons per day by the addition of a fifth contact unit at the Garfield plant. Calera Mining Company began construction of a $750,000 electrolytic cobalt refinery last year following successful operation of a 250-pound-per-day pilot plant. The new electrolytic cobalt plant will reportedly produce 8,000 pounds of high purity cobalt daily when completed.

Utah Production of Iron Ore, Gold, Silver, Copper, Lead, Zinc and Dollar Value of Base and Precious Metals from 1941 Through 1956

Year	Iron Ore Long Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	397,607	356,501	11,395,485	266,838	69,601	42,049	$ 97,796,623
1942	359,558	391,544	10,574,955	306,691	71,930	45,543	113,552,848
1943	922,959	390,470	9,479,340	323,989	65,257	46,896	124,562,540
1944	1,542,284	344,223	7,593,075	282,575	52,519	38,994	111,036,247
1945	1,931,749	279,979	6,106,545	226,376	40,817	33,630	90,018,641
1946	1,317,176	178,533	4,118,453	114,284	30,711	28,292	60,202,627
1947	2,823,853	421,662	7,780,032	266,533	49,698	43,673	158,624,849
1948	3,233,413	368,422	8,045,329	227,007	55,950	41,490	149,763,677
1949	2,712,390	314,058	6,724,880	197,245	53,072	40,670	121,649,828
1950	3,139,926	457,551	7,083,808	278,630	44,753	31,678	159,415,431
1951	4,726,159	432,216	7,310,665	271,086	50,451	34,317	182,897,139
1952	4,060,003	435,507	7,194,109	282,894	50,210	32,947	185,780,497
1953	4,617,288	483,430	6,725,807	269,496	41,522	29,184	195,289,033
1954	3,040,646	403,401	6,179,243	211,835	44,972	34,031	164,367,236
1955	3,847,402	441,206	6,250,565	232,949	50,452	43,556	220,628,713
1956[1]	3,884,000	407,400	6,361,600	248,300	47,900	40,600	254,381,969

1. Estimated by U.S. Bureau of Mines.

Though Utah now has only one phosphate rock producer, it was reported that National Farmers Union plans to begin mining its Cheney phosphate properties in Rich County. Under consideration is the construction of a triple-superphosphate plant to be located near the mine. San Francisco Chemical Company, the state's only producer at present, conducted development work on 3,000 acres of phosphate reserves 14 miles northeast of Vernal. Production from the latter company is shipped to Leefe, Wyoming for processing.

The tonnage of copper produced in 1956 increased 7 percent over 1955 to a total of 248,300 tons. This represented a 20 percent increase in value due to the higher average metal price prevailing last year. The gain in production resulted from a higher production rate at the Bingham Canyon open pit of Kennecott Copper Corporation. Significant developments last year at Utah Copper Division, Kennecott Copper Corporation, included the start of a $12,000,000 ore-haulage tunnel from the bottom of the Bingham Canyon mine to the Copperton switchyards. The close of 1956 also marked the first year of commercial production by the $2,000,000 vertical casting wheel at the refinery. United States Smelting, Refining & Mining Company was another producer of copper, largely as a by-product of lead, silver, and lead-zinc ores mined and smelted.

Lead production decreased by 5 percent, but showed a 2 percent increase in value compared with 1955. Five major producers contribute to Utah's lead output. New Park Mining Company in the Park City district suspended operations at the end of August, but reopened the mine on a curtailed basis in the middle of September. United States Smelting, Refining

There is no charge for having your mining company or mining operation listed in the "United States Mine Directory" which appears exclusively in MINING WORLD.

Please check the Directory which starts on page 161. If your mine is not listed then complete the blank at the bottom of the page and mail it to assure your proper listing in the 1957 Directory.

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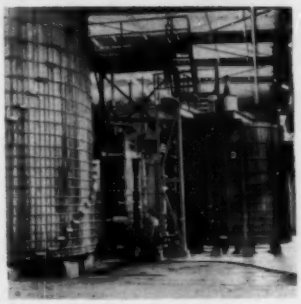

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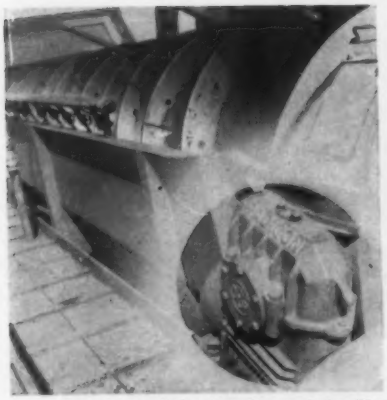

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Washington Production of Tungsten, Gold, Silver, Copper, Lead, and Zinc. Dollar Value of Base and Precious Metals from 1941 Through 1956.

Year	Tungsten* Tons	Gold Ounces	Silver Ounces	Copper Tons	Lead Tons	Zinc Tons	Dollar Value
1941	68	84,176	402,030	8,686	3,903	14,320	$ 7,874,886
1942	45	75,396	369,038	8,030	4,851	14,398	8,172,609
1943	4	65,244	370,440	7,365	5,022	12,203	7,838,012
1944	5	47,277	321,608	6,164	5,825	11,904	7,195,136
1945	2	57,860	281,444	5,281	3,802	11,693	7,140,242
1946	1	51,168	264,453	4,527	2,987	11,329	6,886,748
1947	—	34,965	293,736	2,240	5,359	13,800	7,313,398
1948	—	70,075	375,831	5,665	7,147	12,638	11,171,715
1949	—	71,994	357,853	5,275	6,417	10,740	9,613,307
1950	—	62,117	363,566	5,057	10,344	14,807	12,652,302
1951	9	67,405	344,948	4,089	8,002	18,189	14,030,884
1952	4	54,776	315,645	4,357	11,744	20,102	14,767,054
1953	5	62,560	321,000	3,740	11,064	32,786	15,067,000
1954	18	66,740	313,735	3,636	9,938	22,304	12,305,762
1955	12	74,360	436,348	3,958	10,340	29,536	16,297,361
1956[1]	NA	72,030	496,830	3,759	11,517	25,955	16,814,038

1. Estimated by U.S. Bureau of Mines. * Tungsten (recoverable content of ores) 60% WO₃ basis. NA—Not available.

& Mining Company continued as the major producer with most of the ore coming from the United States and Lark mines in the Bingham district. The most significant event with respect to lead was the agreement reached between Bear Creek Mining Company, Kennecott's domestic exploration subsidiary and several firms in the East Tintic district. Terms cover the exploration of some 10,000 acres with a possible expenditure of $8,500,000. Bear Creek has already done considerable drilling, and has contracted with Centennial Development Company for the sinking of a 1,020-foot shaft on ground belonging to the Apex Standard Mining Company.

The Bureau of Mines reported that over 200 shippers of uranium ore were active during the first half of 1956. This was nearly double the figure for the last half of 1955. Of the total 60,000,000-ton reserve of uranium ore in the United States, Utah contains 7,500,000 tons according to figures released November 1, 1956 by the Atomic Energy Commission. Total uranium mill capacity in Utah is set at 2,650 tons daily with the Uranium Reduction Company accounting for 1,500 tons, Vitro Uranium Company 550 tons, and the Monticello plant of the AEC 600 tons. Important events in uranium mining included longwall mining using telescopic steel props at the Radon unit operated by Hecla Mining Company, pillar extraction at Standard Uranium Corporation, and the sale of the Happy Jack mine to Texas Zinc Minerals, the biggest single transaction yet in uranium last year. The year 1956, also witnessed the full development and attainment of full production of a number of mines opened by shafts in the Big Indian district 30 miles southeast of Moab.

Shipments of iron ore from Utah mines amounted to 3,884,000 long tons last year which was very nearly the same amount produced in 1955. Output during 1956, however, was limited to an 11-month production due to the steel strike. Tungsten production suffered last year because of the termination of the original purchase program at mid-year. The new program (Public Law 733) enacted later did little to stimulate production.

Washington

● Construction Starts On A U_3O_8 Mill; Pend Oreille Extends Incline Shaft Conveyor

Most important development in Washington's 1956 mining picture was start of construction of a $3,000,000 uranium processing plant at Ford, about 40 miles northwest of Spokane, in Stevens County.

The 400-ton acid leach, ion-exchange plant (using columns) is being built by Dawn Mining Company, Newmont Mining Corporation subsidiary, primarily to process uranium ores from the Midnite open-pit mine on the adjacent Spokane Indian Reservation. However, one-fourth of the mill capacity must be used to treat production of other operators. This will provide the first local market for uranium ores and is expected to greatly stimulate exploration and production. The plant is scheduled to begin operations in July or August of this year.

Large reserves of near-surface ore were found on the reservation by Northwest Uranium Mines, Inc., Wallace, Idaho, which announced plans to construct an upgrading plant during 1957. Daybreak Uranium, Inc. made an initial 5-car ship-

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Percent Solids	Sp. Gr. Pulp	TONS SOLIDS PER 24 HOURS				
		GALLONS PER MINUTE				
		20	30	40	50	60
10	1.07	13	19	26	32	48
20	1.14	27	41	55	68	82
30	1.23	44	67	89	111	133
40	1.34	64	97	120	161	193
50	1.46	87	130	174	217	261

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ment of uraninite from the reservation and Big Smoke Uranium, Inc. made a test shipment of a coal-like uraninite. A number of other firms also were active in the reservation.

In the Mount Spokane district, northern Spokane County, Daybreak Uranium, Inc. shipped 26 cars of autunite from its main open-pit operation to bring total shipments to 100 cars averaging 0.32 percent uranium oxide. It also shipped an initial 10 cars from a nearby lease. North Star Uranium, Inc. shipped its first two cars from the same district and Dahl Uranium Mine, Inc. stockpiled ore.

Uranium discoveries were reported from the Ruby Creek and Lamb Creek areas of Pend Oreille County, the old Orient gold district of northwestern Stevens County, and Ferry County's Republic district.

Although lead-zinc exploration was at a low pace, an overlooked ore chimney was uncovered by bulldozer at the old Gladstone mine near Leadpoint, northern Stevens County, and direct-smelter shipments of nearly pure lead boulders started.

Several new copper exploration projects were undertaken during the year. Granore Company, subsidiary of Granby Consolidated Mining, Smelting and Power Company, Ltd., blocked out more than 600,000 tons of milling-grade copper ore at the old Lone Star mine in northern Ferry County. Bear Creek Mining Company, Kennecott Copper Corporation subsidiary, continued a helicopter-lift diamond drilling program at the Glacier Peak prospect, Snohomish County, and made a third $75,000 payment to Glacier Peak Mining and Smelting Company.

Zinc production declined 14 percent but still led other metals in value by a wide margin. Output was valued at $7,007,850 in 1956, compared with $3,685,440 for lead which showed an 11 percent gain. Statistics for other metals in 1956 were: copper valued at $3,150,042 for a 5 percent drop; gold valued at $2,521,050 for a 3 percent decline; and silver valued at $449,656 for a 12 percent increase. American Smelting and Refining Company's Van Stone open-pit mine in northern Stevens County was the state's leading zinc producer. The Van Stone also contributed a significant amount of by-product copper to the state's total although Howe Sound Company's Holden mine continued as the largest copper producer.

The increased lead output was due to expanded production from Pend Oreille Mines & Metals Company which was able to operate the mine on a 6-day week basis. At Pend Oreille, a development program was underway last year which included an additional crusher station at the 1,100 level and a 1,500-foot extension of the ore-conveyor belt which delivers mine output to the surface.

Wyoming

● Two U_3O_8 Mills Authorized During 1956 and Interest In Upgrading Continues to Grow

Authorization for construction of two uranium mills and the blocking out of several million tons of new uranium ore reserves in one district alone kept uranium in the forefront of Wyoming mining news during 1956. Although no production figures were available, it was

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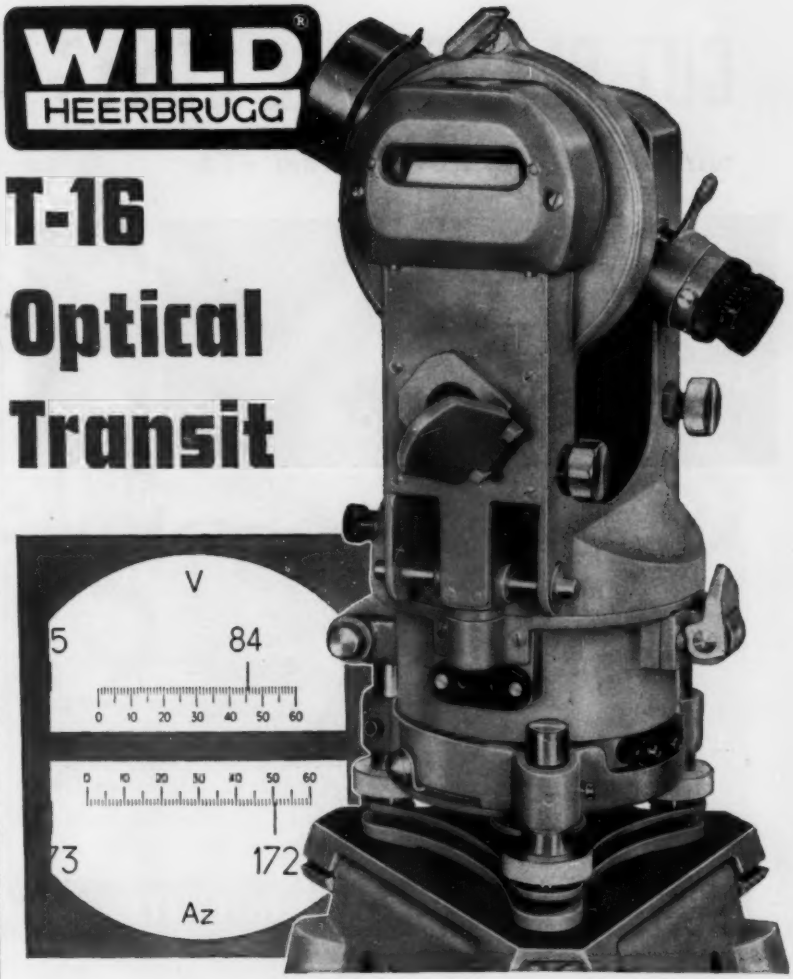

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generally believed that more than 150,000 tons of ore worth more than $5,000,000 were produced during the year.

The Atomic Energy Commission signed contracts with Lost Creek Oil & Uranium Company, of Rawlins, Wyoming, and Lucky Mc Uranium Corporation of Riverton, Wyoming, for construction of uranium mills and the purchase of their concentrate. By year's end, the 450-ton-per-day Lost Creek mill at Split Rock, Wyoming, near Crooks Gap, was well under construction with completion slated for June 1957. The 750-ton-per-day mill of Lucky Mc, which is controlled by Utah Construction Company of San Francisco, California, will be started in the Gas Hills area of central Wyoming in early spring of 1957. More than a million tons of ore has been blocked out on the Lucky Mc property.

Production of uranium ore in the Gas Hills accelerated rapidly during the year with the development of new open pits and one underground operation. Principal producers during the year were Vitro Minerals Corporation, Two States Mining Company, P-C Mining Company, Savanna Construction Company, Gas Hills Uranium Company, Aljob Mining Company, Dale B. Levi, Ran-Rex Mining Company, Vegas Minerals Company, Globe Mining Company, and Kerr-McGee Industries. It is said that 21 companies were active in the Gas Hills area of Freemont County east of Riverton. In the Crooks Gap area, a great deal of drilling was done last year. There also was production of uranium during the year from other areas of the state, including high-grade ore from the Pryor Mountain area and the Pumpkin Buttes and Copper Mountain areas.

Columbia-Geneva Division of United States Steel Corporation started full-scale testing of its large, low-grade iron ore prospect south of Lander. The firm said it would develop the magnetite property if testing, including drilling and a long drift, proves satisfactory. It said development would include construction of a large beneficiation plant and of a 50-mile spur rail line from the Union Pacific at Winton Junction, near Rock Springs, for shipment of ore to the firm's Provo, Utah, mill.

A project to deepen the Colorado Fuel & Iron Corporation's shaft at the Sunrise mine by 160 feet is underway. When completed the loading point will be lowered to the 900-foot level and the seventh level of ore will be developed. The mine is said to be shipping 3,200 tons of ore daily.

Production of trona (natural soda ash) by Intermountain Chemical Co., near Green River, jumped from 300,000 tons to more than 500,000 tons during 1956 with completion of a third shaft to the 1500-foot level early in the year. The company received approval for unitization of a part of its leased holdings, with plans to mine the trona in solution pumped through deep wells.

San Francisco Chemical Company is currently engaged in constructing a 1,000-ton-per-day concentrator for phosphate rock at Leefe, Wyoming. This is an important development since it is the first attempt to actually collect and concentrate phosphate rather than classify or wash the ore with separation of high-grade from low-grade. The plant may enable the use of lower grade feed with recovery of more phosphate. The new mill is expected to be ready by mid-1957. Large low-grade prosphatic beds are known on the northeast flank of the Wind River range in west central Wyoming.

A PICTURE OF

World-Wide Mining

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EUROPE

AUSTRIA

Last year's Austrian report ended with the comment that no sizeable increase in general mining figures can possibly be expected for 1956. In spite of this prognosis the 1955 upward trend prevailed throughout 1956 and new record figures were reached in the main fields of mining and metallurgy.

Iron ore was 14.8 percent above the 1955 figure and magnesite extraction 9.2 percent, both minerals being the most important mining products of Austria. Raw steel production amounted to 2,077,516 tons, a 14 percent increase as compared with 1955. (For the same period the increase of raw steel production of the Montan Union only amounted to 7.9 percent.) The above total of 2,077,516 tons of raw steel consists of 315,320 tons of electric steel, 912,302 tons of Siemens Martin steel, and 849,894 tons of oxygen steel. Quite remarkable was the 26 percent increase of oxygen steel production as compared with 1955.

Bleiberger Bergwerksunion (BBU), province of Caryntha, announced that during the last months of 1956 a new plant for cadmium production was put into operation. In previous times the impurities resulting from the zinc electrolysis which contained cadmium were wasted. Now, since the new cadmium refining plant operates Austria not only is able to produce all its own supply of cadmium, but also to export part of it.

In 1956, production of titanium, tantalum, and zirconium was started by Planseewerke Reutte, province of Tyrol. The better part of this production was exported.

The year 1957 very likely will bring slight increases of production in the main mining fields due to modernization of mining methods and investments.

Austrian Production of Metals and Minerals In Metric Tons In 1954, 1955, and 1956

Commodity	*1954*	*1955*	*1956*
Iron ore, total	2,720,759	2,838,450	3,257,887
Lead-zinc ore	164,721	176,519	163,119
Copper ore	174,757	158,639	152,826
Antimony ore	10,065	10,978	10,356
Bauxite	17,266	19,138	22,093
Gypsum + anhydrite	330,328	412,017	452,834
Graphite	17,403	17,814	18,685
Magnesite	839,153	991,709	1,083,635
Talcum	61,970	70,524	66,055
Kaolin	241,174	260,316	272,364
Pyrite	1,225	1,200	1,475
Lead, conc.	6,884	6,625	6,567
Copper, conc.	10,879	9,307	8,337

EIRE

The Income Tax Concessions granted by the Eire government to new mining enterprises continued to stimulate interest in the country's mineral resources during 1956.

Additional impetus to prospecting was given by reports of favorable development results from St. Patrick's Copper Mines Limited, a wholly owned subsidiary of Irish Copper Mines Limited of Toronto, Canada. The company simultaneously with mine development is installing a mill at Avoca to treat 4,000 tons per day of cuprous pyrite and it is expected that production will commence within about 12 months.

Explorers Alliance Limited of Canada was engaged in the examination, including diamond drilling, of the Bunmahon copper mines in County Waterford. Samples of the ore sent to Canada gave high gold assay values.

This company through its subsidiary, St. Kevin's Lead & Zinc Mines Ltd., is carrying out development and exploration at the Glendalough lead and zinc mines in County Wicklow which in the early part of the year were being worked for lead on a small scale (50 tons per day) by the Wicklow Mining Company Limited, who prospected the Caim lead-copper mines about 40 miles South of Glendalough.

Explorers Alliance are to extend their prospecting activities to West Cork.

The Can-Erin Mining Company, also of Canada, through its subsidiary the Emerald Isle Mining Company are dewatering the extensive Allihies copper mines in County Cork. Diamond drilling from surface and underground progressed and some high grade copper intersections were reported. This company is also reported to have obtained gold values of over 1.0 ounce per ton in the course of examining an abandoned antimony mine near Clontibret in County Monaghan.

New Springs Coulee Oil and Minerals Limited, also of Canada, through its subsidiary, Minerals Development Corporation Limited showed interest in the Hollyford copper mine in County Tipperary.

The Priority Mining and Drilling Company Limited of Canada prospected the Oughterard lead mines in Galway. These mines last produced small quantities of lead ore in about 1870; some of them are said to be rich in copper pyrite.

The Abbeytown Mining Company Limited operating in County Sligo maintained production of lead and zinc concentrates. Diamond drilling was in progress to extend ore reserves.

The Silvermines Lead & Zinc Company Limited continued production from its Shallee lead mine. A heavy media plant was installed and mining was at the rate of 10,000 tons per month. Exploration by geophysical survey and diamond drilling proved extensions to the ore reserves and located a new zinc-lead deposit in dolomitic limestone.

The total amount of lead concentrates, approximately 70 percent Pb, produced in Eire for the year was 3,600 tons. Zinc concentrate output was approximately 3,400 tons of 55 percent Zn. Both show an increase over previous years.

Gypsum production was maintained at a little over 100,000 tons while barite production was increased to 7,000 tons.

FINLAND

In 1956 production of metal mines in Finland reached an all-time record in spite of the general strike in March that paralyzed all industry in the country for about three weeks.

The Outokumpu Company continued the operation of four mines: Outokumpu, Vihanti, Aijala, and Ylöjärvi.

During 1956 the production of vanadium was started by the Otanmäki Company in a new plant. To recover vanadium from the magnetite concentrate, a drying section and a dry magnetic separator section were added to the Otanmäki concentrator. Dried, recleaned magnetite concentrate is pelletized in the vanadium plant, after which vanadium is recovered by chemical methods. From the leaching solution, vanadium is precipitated, filtered and melted to high grade V_2O_5. The present capacity of the vanadium plant is about 80,000 tons of magnetite concentrates producing 500 tons of V_2O_5 per year. The capacity will be doubled in 1957.

The Vuoksenniska Company was active with the development of two undersea magnetite deposits. One of them is situated in the Aland Islands, the other on the southern shore of Finland near the isle Jussarö. At the former, an exploration shaft was sunk from Nyhamn isle and a drift about a mile long will be driven during this year to the ore body. Similarly, an exploration shaft is being sunk from the isle Stor Jussarö, after which a drift will be driven to the undersea ore bodies. To treat the concentrates from these two new deposits, the company has already started the construction of a smelter, a steel plant, and a rolling mill. The first phase of operations is expected to start in 1959.

In 1956, prospecting and exploration in Finland reached an all-time high. The future of mining in Finland looks promising.

Mine Production In Terms of Ores Milled, Minerals, and Metals Recovered by Finnish Mining Companies in Metric Tons for 1954, 1955, and 1956

Commodity	*1954*	*1955*	*1956*
Outokumpu Company			
Ore milled	1,004,467	1,104,702	1,221,395
Copper conc.[1,2]	101,992	104,175	100,409
Pyrite conc.	249,569	298,508	288,684
Zinc conc.	9,159	40,682	75,066
Lead conc.	478	1,353	2,650
Tungsten conc.	110	115	59
Nickel-copper conc.	3,017	—	—
Otanmäki Company			
Ore mined[3]	503,803	638,958	742,399
Ore milled[3]	396,032	514,955	595,009
Magnetite conc.	134,022	184,474	206,168
Ilmenite conc.	50,589	84,974	102,915
Pyrite conc.	2,946	4,338	5,401
V_2O_5 (100 %)	—	—	68.6
Vuoksenniska Company			
Ore milled	120,000	115,926	120,029
Gold[4]	316	264	197
Copper conc.	2,160	2,085	1,576

1. Average Cu content for 1955 was 20.4 percent. 2. Average Cu in 1956 was 20.7 percent. 3. Difference between ore mined and milled is the lump waste separated in a magnetic cobbing plant. 4. Kilograms.

FRANCE

France produced 13,000 tons of lead ore and 23,000 tons of zinc ore in 1956. The lead production was down somewhat from 1955, but the zinc output was an increase of 3,000 tons. Imports from Algeria and Morocco furnished additional

ore for the French smelters which produced 63,000 tons of lead bullion and a little over 112,000 tons of zinc metal. The zinc figure was about the same as in 1955; the lead output reflected a slight decrease caused by strikes.

Bauxite production was stabilized at about 1,500,000 tons, the amount also produced in 1955. Cadmium showed a decline from 180 tons in 1955 to 108 tons in 1956. This output comes from the Vieille Montagne plant. Production of cobalt from the Pombliere plant increased slightly from 308 tons to 375 tons. New strikes cut production of tin at the Abbaretz mine from 702 tons in 1955 to 630 tons in 1956. A strike also paralyzed the Havre nickel plant for a month and a half, causing output to drop from 5,500 tons in 1955 to 5,200 tons in 1956. The ore came from New Caledonia.

The Ouche antimony mine produced 400 tons of ore last year, while in 1955, when it was reopened, it produced only 168 tons. With the addition of imported ore, the smelters turned out 1,800 tons of metal, slightly under the 1955 figure.

Asbestos output was 8,500 tons. The Salsigne bismuth plant produced 64.5 tons, compared with 31 tons in the previous year. Using imported blister copper and anode copper, the French smelters produced 20,000 tons of refined copper. Pyrite production remained at around 305,000 tons; talc showed an increase from 116,000 tons to 134,000 tons; tungsten output reached 1,000 tons; fluorspar increased from 60,000 tons in the previous year to 67,000 tons in 1956. After the drop in 1955, phosphate production remained at about 67,000 tons in 1956.

The Noyelles-Godault plant produced 38,500 kilograms of silver. Previous output had been 51,000 kilograms, but strikes caused the cutback. The production of gold was resumed at the Farges mine with 16 kilograms. Output from the Salsigne plant as a byproduct was 1,060 kilograms.

Smelter Production in Western Germany in Metric Tons For 1951, 1952, 1953, 1954, 1955, and 1956

Commodity	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*[1]
Aluminum	74,132	100,474	106,940	129,219	137,066	147,362
Lead (incl. lead produced by battery manufacturers)	149,680	135,473	147,025	147,677	147,426	161,766
Copper (refined)	204,848	187,706	211,677	234,291	259,733	253,450
Zinc (excluding dust)	148,465	150,804	150,619	169,339	179,969	190,630
Tin (unalloyed)	848	1,442	1,574	1,355	1,420	1,734
Tin alloys	2,440	3,088	2,670	3,781	4,417	4,163
Solder	6,105	5,676	7,522	8,768	8,975	10,173
Pig iron	10,697,000	12,877,000	11,654,000	12,512,000	16,482,000	17,577,000
Steel ingots and castings	13,506,000	15,806,000	15,420,000	17,434,000	21,336,000	23,189,000

1. Estimated.

Mine Production in Western Germany in Metric Tons For 1950, 1951, 1952, 1953, 1954, 1955, and 1956

Commodity	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*[1]
Lead ore[2]	46,900	50,700	51,700	63,000	67,700	68,100	66,200
Zinc ore[2, 3]	98,400	101,900	106,900	116,100	120,700	120,200	121,800
Copper ore[2]	1,700	2,100	2,700	2,500	2,700	2,000	1,700
Pyrites	548,961	572,038	571,300	561,727	601,460	643,300	650,000
Iron ore, crude weight	10,883,000	12,926,000	15,413,000	14,622,000	13,037,000	15,684,000	16,928,000
Iron ore, iron content	2,939,000	3,473,000	4,102,000	3,899,800	3,551,000	4,226,000	4,512,000
Potash salts crude weight	8,926,534	10,847,600	12,585,100	12,586,400	15,575,700	16,106,400	15,544,000
Potash salts, K_2O-content	1,095,800	1,323,300	1,553,700	1,577,000	1,935,600	2,019,600	1,965,000
Salt (rock and evaporated)	2,468,600	2,757,300	2,576,000	2,874,000	3,126,000	3,384,000	3,581,000
Graphite	7,238	10,304	8,411	7,108	9,112	10,463	[4]
Fluorspar	92,539	140,390	146,570	161,224	173,196	154,962	[4]
Barite	285,226	388,836	285,322	303,383	383,367	414,321	[4]
Bauxite	4,161	5,381	7,186	7,848	4,220	3,875	[4]
Gypsum	355,783	468,700	587,263	641,200	631,502	713,135	[4]
Feldspar	76,702	98,231	102,909	95,701	126,585	166,224	[4]
Soapstone	——	——	12,045	11,892	16,527	18,000	[4]
China clay	——	——	——	——	314,194	350,249	[4]
Fuller's earth	——	——	——	——	179,799	216,046	[4]

1. Preliminary. 2. recoverable metal content. 3. Including recoverable zinc content of pyrite. 4. Not available.

FEDERAL REPUBLIC OF GERMANY

Mine production in Western Germany changed very little in 1956 as compared to the level reached in 1955. Iron ore output was slightly higher, while the production of potash salts was somewhat lower.

Smelter production generally increased during 1956 and new postwar highs were attained by aluminium, lead, zinc, tin. pig iron and steel. The only exception being copper, the output of which showed a decrease of about 2.0 percent, due to lower scrap imports, especially from the United States.

GERMAN DEMOCRATIC REPUBLIC

It is impossible to get reliable information from countries behind the Iron Curtain. Therefore, the following data are more or less guesswork and therefore to be used with caution. However, MINING WORLD believes the figures are fairly accurate.

Virgin aluminium output is estimated at 30,000 metric tons in 1956. The capacity is to be increased to 65,000 tons by 1960 (Bitterfeld, at present the only producer, 40,000 tons, Lautawerk 25,000 tons). At present, alumina is produced at Lautawerk. Secondary aluminium output is estimated at 12,000 tons in 1956.

Total production of copper, including secondary, is estimated at 32,000 tons annually. About 24,000 tons of lead is also produced, mainly from scrap. An electrolytic zinc plant is in the course of construction near Freiberg (Saxony), but there exists no production of primary zinc metal as yet. About 4,500 to 5,000 tons of zinc is recovered in the form of zinc oxide or sulphate. Furthermore about 200 tons of nickel, 700 of tin, 13 of selenium, 150 kiligrams of Rhenium, and 3 tons of vanadium are produced annually.

Potash salts (K_2O-content) production is said to have amounted to 1,424,000 tons in 1955, and may have been about the same in 1956.

GREECE

The nickel plant at Larymna reportedly went into operation during the year, under the direction of the Greek Chemical Product & Fertilizer Company. Initially it will produce nickel iron, but it is hoped that nickel steel production will be possible soon. An annual total of 150,000 tons of ore will be processed. The German firm of Krupps supplied most of the machinery.

Hellenic Company of Chemical Products and Fertilizers Ltd. increased chemical fertilizer output at is Piraeus plant from 60 to 100 tons a day during the year as part of a government program to stimulate food production. A new 100-ton plant, presently producing ammonium phosphate but designed by Dorr-Oliver Inc. to manufacture either triple superphosphate or ammonium phosphate, has replaced the 60-ton installation designed by the same firm and initially placed in operation in 1934. Raw material used is Gafsa phosphate rock from Tunisia.

Large scale barite mining commenced in October with first shipments to the United States in November. A new company formed in 1955 to mine high grade deposits on the island of Mykonos made the shipment. Regular production is scheduled to continue. The company—Mycobar Mining Company—was formed by Magnet Cove Berium Corporation and Myconos Mining Company S. A.

NORWAY

The production of iron and ilmenite ores again reached record levels in 1956 in Norway. A/S Sydvaranger reached full production at its taconite mine in northern Norway to lead iron producers while A/S Titania increased production of magnetite-ilmenite ore.

Pyrite production also increased and in the Grong district in northern Norway important prospecting and mine development continued. A/S Norsk Bergverk started to drive a long crosscut into the Joma ore zone. At Gjersviken diamond drilling continued to obtain additional data to base mine development on. Geological prospecting continued for extensions of the pyrite deposits.

The steel plant at Mo i Rana reached full production which made possible the marked increase in output of electric pig iron in last four years. Erection of another electric furnace is planned.

Norwegian Production of Metals and Minerals in Metric Tons in 1953, 1954, 1955, and 1956*

Commodity	1953	1954	1955	1956*
Iron ore	1,186,293	1,094,577	1,255,584	1,513,683
Ilmenite ore	128,113	149,185	157,833	190,503
Pyrite ore[1]	744,856	794,914	843,776	863,000
Copper conc.	24,763	26,375	26,672	27,932
Zinc conc.	11,122	11,230	14,001	13,267
Lead conc.	874	1,124	1,070	1,221
Molybdenum conc.	258	265	288	300
Niobium ore (Soevit)	564[2]	178[3]	320[4]	260[5]
Graphite	2,953	3,622	5,416	5,000
Pig iron (electric)	58,844	59,920	123,332	180,000
Aluminum	56,198	64,101	71,760	92,690
Copper	12,104	12,891	13,737	15,180
Copper Skjaerstone (33 to 35% Cu)	13,246	12,494	13,710	13,391
Zinc	38,798	44,461	45,519	48,636

* Preliminary. 1. About 290,000 tons of this ore is smelted to produce the copper Skjaerstone listed in table. 2. With 5.0 percent Cb_2O_5. 3. About 50 percent Cb_2O_5 + Ta_2O_5. 4. About 41 percent Cb_2O_5. + Ta_2O_5. 5. About 50 percent Cb_2O_5.

Aluminum production also increased and will continue as plant additions are completed and the new plant at Mosjoen gets into production.

A/S Norsk Bergverk was changing its columbite (soevit) mine from an open pit to underground operation. The firm also plans to produce metallic columbium at a new smelter.

Prospecting in the far north Finnmark district continued during 1957 and will be resumed in the summer of 1957. In the Kautokaino district geophysical and geological prospecting was followed by drilling in the search for copper ore. Prospecting for iron was done in the Karasjokk district.

Norwegian smelters are using increasing amounts of olivine for a flux because there is less risk of silicosis than from other rocks.

A/S Olivin operating at Aaheim in western Norway plans to enlarge its plant and increase production of fine crushed olivine to meet increasing demands.

PORTUGAL

The Portuguese mining industry in 1956 was little changed in relation to that of 1955. Listing the main minerals, one can observe the following developments:

Tungsten: The Minas da Panasqueira (Fundão, Castelo Branco) with 180 to 200 tons output per month, continued to be the greatest producer of wolframite. Next were the Minas dos Carris, (Cabril, Montalegre, Vila Real) with 50 tons per month; the Minas da Borralha (Salto, Montalegre, Vila Real) with 40 tons per month; and the Minas de Vale das Gatas with 35 tons per month. Other groups of mines were Bejanca-Carvalhal (Carvalhal, Vouzela, Vizeu); Minas da Ribeira (Parada, Braganca); Minas de Adoria (Serva, Ribeira da Pena, Vila Real); and Covas (Vila Nova de Cerveira, Viana do Castelo). All these mines can increase their output.

The mines of Fonte Santa (Lagoaça, Moncorvo, Bragança) and Azevo (Azevo, Pinhel, Guarda) with a total output of about 28 tons per month and Covas (Vila Nova de Cerveira, Viana do Castelo) with six tons per month, are the main scheelite producing centers. Under present production, all these mines have reserves for several years.

Tin: The Portuguese American Tin Company with a monthly production of 30 tons continued to be the chief producer of cassiterite. This firm is dredging an alluvial bed in the Vale de Maçainhas, Belmonte, Guarda, but as it has small reserves, the company studied the possibility of dredging the large alluvial basin, Nave de Haver (Vilar Formoso, Almeida, Guarda).

The Minas de Ervedosa (Ervedosa, Vinhais, Bragança) and the Minas da Ribeira (Parada, Bragança) with productions of the order of 25 and 30 tons per month, respectively, are the most important miners of vein deposits.

Mineral and Metal Production in Portugal in 1955 and 1956, In Metric Tons

I—*Ores*	1955	1956
Amblygonite (7% Li)	4	—
Amianthus	51	32
(a) Arsenopyrites	6,125	4,121
(a) Arsenopyrites auriferous and argentiferous (raw concentrates with 115 gr/tons Au. and 235 gr/ton Ag.)	7,795	4,150
Arsenopyrites and cassiterite (mixed 12% Sn)	908	—
Barite	324	260
Beryllium (11% OBe)	306	185
Sphalerite	594	909
(b) Cassiterite (65% Sn)	1,742	1,478
(b) Cassiterite and ilmenite (mixed 25% Sn, 17% TiO_2)	49	78
(b) Cassiterite and wolframite (mixed 25% Sn, 25% Wo_3)	789	771
Coal	492,136	559,163
Columbite and tantalite	51	24
Copper Ores (25% Cu)	23	173
Copper precipitated (63% Cu)	145	114
(c) Galena (65% Pb)	2,440	1,982
Hematite	139,864	161,205
Ilmenite (35% TiO_2)	786	533
Kaolin	42,306	47,788
Magnetite	49,722	73,227
Manganese ores (42% Mn)	3,981	3,176
Molybdenite	11	14
(d) Pyrites	670,748	669,786
Salt (85% ClNa)	48	17
Scheelite (65% WO_3)	375	309
Scheelite and cassiterite (mixed 25% WO_3 25% Sn)	109	133
Talcum	10	73
Tripoli	2,267	1,794
(e) Wolframite (65% WO_3)	3,569	3,972
II—*Products from treatment of ores*		
(a) Arsenious anydride (97/99%)	1,790	1,623
(b) Tin-metal (99.5%)	1,034	1,162
(c) Lead-metal (99.8%)	972	838
(d) Copper concentrates (9.6%)	5,072	6,765
(d) Sulphur	15,713	17,194
(e) Ferro-tungsten	331	381

Obs.—1—The II only includes the production of ore dressing plants, with the exception of tin metal, which is the total production for the whole country. The minerals that gave origin to these products are inclused in I.
2—The numbers mentioned in 1956 are subject to ratification.

The Minas de Panasqueira, already listed under wolframite, also produced cassiterite, at about 15 tons per month.

The Grupo de Montesinho (Bragança) appears very promising.

A large part of the production of cassiterite is derived from numerous alluvial deposits and small mines.

Gold: The first prospecting work at the Minas de Santo António e Vieiros (Granja, Penedono, Vizeu) did not fully confirm the forecasts, especially the gold and silver content which were less than initially hoped for. The work is being continued in a second phase in the hope that more favorable areas may be found.

The Minas de Jales (Alfarela de Jales, Vila Pouca de Aguiar, Vila Real) with a production of 600 kilograms of gold per year and 2,500 kilograms of silver is still the main source of gold in Portugal. The mineralization on the 8th level (about 300 meters in depth) continues to be good.

Iron: continues to be mined at a rate of about 120,000 tons per year at the hematite deposit Moncorvo (Moncorvo, Bragança). This is a deposit with reserves of several hundreds of million tons.

At the magnetite mines of Vila Cova (Vila Cova, Vila Real) the construction of a company steel was under way.

Pyrite: The Minas do Louzal (Grandola, Setubal), S. Domingos (Mértola, Beja), and S. João do Deserto e Algares (Aljustrel, Beja) with a combined monthly production of 56,000 tons continued to be the main producers of pyrite. They have large reserves; some of companies are to cooperate in the exploration carried out by the government, through its department, Serviço de Fomento Mineiro.

Mineral and Metal Production in Portugal in Metric Tons For 1954, 1955 and 1956

Commodity	1954	1955	1956
Arsenopyrites	9,931	6,125	4,121
Arsenopyrites (fold or silver bearing)	4,438	7,795	4,150
Tin conc. (65% Sn)	1,553	1,742	1,478
Lead conc. (65% Pb)	2,920	2,440	1,982
Hematite	82,180	139,864	161,205
Magnetite	30,109	49,722	73,227
Pyrites	584,387	670,748	669,786
Tungsten conc. (65% WO_3)	3,922	3,944[1]	4,281[2]
Refined sulphur	16,357	15,713	17,194
Tin (metal)	—	1,034	1,162
Lead (metal)	—	972	838
Ferrotungsten	—	331	381

1. Includes 375 tons Scheelite. 2. Includes 309 tons Scheelite.

SPAIN

In general, Spanish mining production was greater in 1956 than in 1955.

Lead output rose to 61,174 tons, an increase of 1,174 tons over the 1955 figure. Domestic consumption was 34,-714 tons, while 25,822 tons were exported. Of the latter amount, 8,050 tons went to the United States. Development of new mines is continuing and old tailings are being re-worked so it is expected that production in 1957 will exceed that of 1956.

Pyrite production totaled 2,294,192 tons, as compared with 2,043,728 in 1955. Production of blister copper was 6,295 tons. Plans are being made for installation of plants which will recover copper from pyrite sinter.

Metallic zinc production was 22,840 tons, slightly under that of 1955 which

Production and Export of Swedish Mineral Products in Metric Tons for 1952, 1953, 1954, 1955, and 1956

Commodity	1952		1953		1954		1955		1956	
	Production	Export	Production	Export	Production	Export	Production	Export	Production	Export
Iron ore	17,000,000	15,700,000	17,130,000	14,553,000	15,416,000	14,083,000	17,450,000	15,654,000	19,075,000	17,290,000
Pyrite	402,000	10,400	386,291	12,000	398,235	10,448	391,561	15,781	489,119	55,328
Lead conc.	27,400	12,000	33,954	8,346	40,372	10,110	43,870	12,982	46,085	15,332
Zinc conc.	66,600	81,000	78,583	76,393	103,335	110,356	104,557	105,074	117,166	127,746
Copper conc.	47,100	—	52,679	—	53,476	—	67,163	—	69,232	—
Tungsten conc.[1]	435	—	440	—	450	—	458	—	450	—
Fluorspar	—	—	—	—	—	—	1,000	—	—	—

1. 60 percent WO_3.

reached 23,738. Production of concentration was 154,788 tons. New installations for zinc smelting will soon be in operation.

Iron ore production also rose during the year. Output in 1956 was 5,712,932 tons compared with 4,700,000 in 1955. In Spanish Morocco, production was 1,264,788 tons, also greater than the preceding year's figure of 1,036,000 tons. Prospecting for iron ore was very active during the year.

Tin production was 535 tons, less than for the previous year. Aluminum production also increased to 13,466 tons. On the other hand, wolframite mining declined, showing an output of only 1,292 tons.

Manganese ore was also down, with an output of 31,460 tons, compared with 41,468 tons in 1955. Mercury exports were greater than those of the preceding year, amounting to 45,546 flasks. Moreover, expansion of the Almaden installations was well underway.

SWEDEN

Increased exports plus greater demand of Swedish steel mills resulted in an all-time record high output of 19,075,000 metric tons of iron ore in 1956.

Underground mine development and additional beneficiation capacity were accelerated throughout the year to insure increased production in the years ahead. Under the Long-Term-Program iron ore output is scheduled for 21,400,000 tons in 1960 and 23,100,000 in 1965.

The tonnage of iron ore beneficiated increased rapidly. Both the Swedish Svensson heavy density process and foreign processes found an ever increasing field of application. Dry crushing, magnetic roasting, and hematite flotation are planned on an increasing scale.

Underground production at the Kiruna mine of Luossavaara-Kiirunavaara AM (LKAB) was gradually increased as major mining, crushing, and hoisting plants were completed.

At the government owned iron ore fields of Lapland 100,000 annual tons will be mined instead of the earlier planned 50,000.

In the Luossavaara district output amounted to 500,000 tons of ore owing to the resumption of production from the Rektors mine. At Malmberget, owned by the same company, the new hoisting plant with belt conveyors worked satisfactorily during the year.

The iron works of Tuolluvaara was rebuilt and an aerial tramway is to be replaced by a railway to Kiruna.

Trafikaktiebolaget Grängesberg-Oxelösund (TGO) began extending the mine at Strässa in central Sweden, which will yield annually 450,000 tons of iron ore concentrate earmarked for the enlargement of the Oxelösunds Steel Works to an annual production of 430,000 tons of pig iron and the same quantity of steel ingot.

The mining at Strässa is calculated to begin in 1959 and the new works will have an hourly capacity of 250 tons. A shaft is being sunk to the depth of 250 meters.

In 1956 TGO procured Guldsmedshytte AB with its blast furnace and mining plants, situated near Strässa.

At Grängesberg TGO prepared a new mining level at 410 meters where mine cars of 35 tons capacity will be used for underground transport.

From other central Swedish iron mines the following was reported:

At Bispberg in Dalecarlia the ore body which was indicated earlier by means of electrical prospecting was found at great depth. After sinking a shaft to a depth of 520 meters and driving a 1.5 kilometer level the upper part of the ore was discovered. The ore is probably a faulted part of the Bispberg ore body now being mined. It is a very pure magnetite ore.

AB Statsgruvor is preparing to mine an extension of the Håksberg field at Ludvika and the Karlvagns field at Norberg. Ore from both fields will require concentration.

Surahammars Bruk built a shaft tower and a crushing mill at the Kallmora mine in Norberg; a new concentration mill is planned.

Norbergs Grufförvaltning (Mining Administration) carried on the underground preparatory work for the new central plant, which is estimated to yield 500,000 tons of products yearly.

At Vingebacke, where an ore body was indicated at depth by means of electrical prospecting, production commenced. The ore was concentrated at the works of Hofors Bruk at Långnäs near Hofors.

In Dannemora, a concentrating mill is being built in connection with the new dressing plant now in operation for manganiferous iron ore.

In the sulphide ore area of Skellefteå the Boliden Company completed a mine plant in Rudtjebäcken near Adak. The production capacity of iron pyrite ore is 180,000 tons. The ore is transported by cars 60 kilometers to Kristineberg where it is treated in the enlarged mill.

The Boliden Company established an experimental station in its new central concentration works in Boliden.

With the exception of the 5.0 kilometer underground transportation from Långsele to Boliden, all the ore is transported to the concentration mills of the Boliden Company in Boliden and Kristineberg by trucks. Each truck has a total load capacity of 60 tons.

The interest in prospecting for uranium was very great and a number of concession applications were received.

The SGU—Sveriges Geologiska Undersökning—(Swedish Geological Investigation Institute) discovered a new copper deposit at Brännmyren near Adak.

The Laisvall mine reached its calculated annual output of 500,000 tons of lead ore.

UNITED KINGDOM

Iron ore and China clay output continued at high levels in the United Kingdom in 1956. Steel production is to be expanded in the next six or seven years so there is optimism about iron ore mining. Iron ore production averaged close to 311,000 tons weekly. While most of this ore is mined from open pits the trend is increasingly to underground mining.

In the non-ferrous metal mining field, a great deal of exploration is necessary if any appreciable expansion is to take place.

As the British Metal Mining Association pointed out, operations over very many years accentuated by the needs of two World Wars exhausted the more accessible deposits. Extensive exploration and development will therefore be necessary to restore the industry to its former productivity.

Tin production increased slightly to about 1,550 tons of 70 percent tin concentrates from the Cornish mines. The South Crofty mine operated at a profit and declared a dividend. This was an achievement in the face of rising wages and other costs. However, the total cost per ton of ore mined and milled was reduced by lower pumping costs, at the new pumping plant, and increased tonnage. The rebuilding of the mill continued during the year with work progressing in stages so as not to interfere with production. Additional table capacity was added and part of a middling regrind circuit put into operation. A heavy media plant is being installed and the stamp mill will be replaced at a future date by a rod mill. Concentrate production was increased to about 60 tons per month.

The Geevor mine, second largest Cornish producer, had a successful year. Ore reserves were being blocked out to warrant the sinking of a new shaft in the future to effectively mine some of the more remote lodes.

During 1956, both Mineral Recovery Ltd. and Hydraulic Tin Ltd. reopened their treatment plants. The former treated beach sands at Gwithian, near Cambourne, and the latter treated accumulated tailings in the Biscoe Valley near Truro.

The small wolframite mine at Hawkswood on the edge of Bodmin Moor was bought by the Pena Copper Company who are now operating it. This company also acquired control of Tungsten Manufacturing Ltd.

The production of lead has increased over the last 10 years and was around

11,057 tons in 1954. It does not seem that the 1956 figure will be more than 7,000 tons according to the Minister of Supply.

Zinc production has fluctuated somewhat, rising from almost nothing in 1950 to over, 3,000 tons in 1953 and falling to 2,475 tons in 1954 while it was about 3,000 tons in 1956.

Production was maintained at the Greenside mine, Cumberland, at Halkyn United Mines in North Wales, and at Parc Mine Llanrwst, also in North Wales.

At Halkyn the throughput was much the same as in the previous year. Production of lead concentrate at 2,743 tons showed a very slight increase over the 1954 figure but there was a fall in the zinc output to 621 tons.

At the Lowland Lead Mines at Wanlockhead, Scotland, a subsidiary of Siamese Tin Syndicate, development resulted in an increase in ore reserves to 96,000 tons at the end of 1955 and more has been added since. An exploratory crosscut has given grounds for optimism but so far all work has been confined to the Wanlockhead mine. The construction of a treatment plant near completion.

New Consolidated Goldfields explored lead mines in the Allenhead area near the border of Northumberland and County Durham and commenced an exploratory crosscut near the bottom of an incline shaft in the Swinhope mine.

On the Isle of Man, two new companies were formed to prospect the area for lead and zinc. The British Mining Corporation in connection with John Taylor & Sons with the support of local business interests formed the Island Exploration Company. Metalliferous Holdings Ltd., another company, is to reopen the Snaefell lead-silver mine.

In Cheshire, there is still one mine, the Meadowbank, producing rock salt from underground working and is owned by Imperial Chemical Industries Ltd.

YUGOSLAVIA

Mining had a very favorable year in Yugoslavia in 1956. Production of ore was generally up as was the output of most metals. However, the trend was toward the mining of larger tonnages of lower grade ores so that metal output, in most instances, did not reflect increase in tonnages.

Production of lead and zinc *ore* increased over five percent in 1956 in comparision with 1955. The production of refined lead remained at the previous high level, an all-time high.

The Trepča firm's lead smelters (South Serbia) produced 63,216 tons of refined lead from its own Stari trg mine, from neighboring mines of Kopaonik, Ajvalija, and Janjevo, and from lead concentrates from flotation plants at Novo Brdo, Lece, Rudnik, and Veliki Majdan (Serbia); Zletovo (Macedonia); and Suplja Stjena (Montenegro).

An oval-section winze was being sunk at the Stari trg mine to develop two new levels in the ore body below the existing workings. At the Koporić prosepect 20 kilometers to the northwest, 2,000,000 tons of low grade lead-zinc ore were outlined.

The Mežica lead smelter (Slovenia) produced 12,543 tons of refined lead from ore mined at its own mines. A new Dwight-Lloyd sintering plant with a daily capacity of 200 tons of sinter was installed. It will operate either up- or down-draft. Two Short-Drum furnaces were also erected. Smelting in these will begin in the spring of 1957.

The Kižnica ore body (Kosovo) was being developed. By year's end several million tons of ore containing two to four percent lead was developed. At Srebrenica (Bosnia) prospecting below the old workings indicated 4,000,000 tons of ore (15 percent Pb plus Zn). The ore from the Kižnica and Srebrenica prospects was treated in the Trepča flotation plant.

Zinc production increased slightly. The zinc smelter at Celje (Slovenia) produced 13,809 tons. The electrolytic zinc plant at Sabac (Serbia) started production in the spring of 1956. Approximately 5,000 tons of cathode zinc was produced. Most of it remained in stock, unfinished, as the remelting and casting furnace started only in December. At Celje a seven-story roasting furnace was installed and a new sheet rolling plant built.

Copper ore output increased 18 percent; also copper production increased four percent. Since June 1956 the new flotation plant at Bor (Serbia) with a capacity of 3,000 tons per 24 hours was in operation. Total flotation capacity now being 7,000 tons per 24 hours. The new plant uses rod-mill crushing followed by ball-mill grinding. About 15 percent of the ore contains over 4.0 percent Cu and is smelted directly. About 85 percent contains approximately 1.5 percent Cu and is concentrated to over 20 percent by flotation. A large shaft is being completed to undercut the present open pit workings.

The new copper mine, Crni vrh, 15 kilometers north of Bor, was being developed and will start producing middle grade ore in 1957. The known ore reserves of the Bor mines can sustain copper output at the present rate for 25 years. The Majdanpek copper prospect (projected 10,000 tons 1.8 percent Cu ore per day) waits for the huge capital needed to bring it into production.

Pyrite concentrates were produced at Bor (87 percent of total) and at Trepča (13 percent).

Antimony ore and metal production increased slightly. The only smelters in operation are at Zajača (Serbia). At Lojane and Alšar (Macedonia) larger ore bodies contain arsenic and antimony. Separation tests were underway.

Mercury production at Idria (Slovenia) was nearly 10 percent lower than in 1955. Lower grade ore was the reason for the decline.

Bauxite production increased 11 percent and superceded all previous records. Some 92 percent was exported. Alumina production overreached 48,000 tons; 37,800 tons from Kidričevo, the rest from Moste-Ljubljana and Lozovac.

Aluminium production increased 28 percent. The new plant at Kidričevo (Slovenia) produced 11,355 tons, the plant at Lozovac (Dalmatia) 3,327 tons. Kidričevo can produce 15,000 tons per year but was limited by the supply of power. At Ražine (Dalmatia) a third plant with a capacity of 4,500 tons of aluminium was being completed. According to an agreement signed in August, the Soviet Union and East Germany should provide financial and technical help for the construction of a further alumina-aluminium combination with a capacity of 50,000 tons of aluminium. The matter was under discussion, and construction work did not start by year's end.

Chromite production remained on the level of 1953, 1954, and 1955.

Iron ore production increased by 23 percent, pig iron production also 23 percent, and steel production 10 percent. The main ore producer was Vareš (Bosnia). Open pit mining will be introduced there to increase the capacity from 1,000,000 to 1,300,000 tons of ore per year. At Tajmište (Macedonia) new ore bodies with approximately 40,000,000 tons of magnetite were developed.

Metric Tons of Metal Produced in Yugoslavia in 1939, 1951, 1952, 1953, 1954, 1955, and 1956

Metal	*1939*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*
Refined Lead	10,651	60,068	67,180	70,796	66,729	75,612	75,759
Zinc	4,918	13,223	14,463	14,549	13,644	13,767	14,003
Blister copper	41,043	32,011	32,819	31,190	30,295	28,260	29,384
Electrolytic copper	12,463	14,004	21,390	27,764	26,946	24,837	25,008
Antimony	1,500	1,229	1,329	1,410	1,552	1,605	1,663
Mercury	378	505	504	492	498	503	456
Aluminum	1,795	2,828	2,563	2,792	3,496	11,499	14,682
Bismuth	—	88	99	98	110	104	111
Silver	1	94	80	95	88	93	86

Metric Tons of Iron Ore Mined, Pig Iron and Steel Produced in Yugoslavia in 1939, 1951, 1952, 1953, 1954, 1955, and 1956

Commodity	*1939*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*
Iron ore		581,352	676,010	794,917	1,110,743	1,398,298	1,724,967
Pig iron		248,000	272,884	269,748	356,000	513,797	630,574
Steel		434,000	442,354	514,537	616,298	806,023	886,730

Metric Tons of Ore Mined in Yugoslavia in 1939, 1951, 1952, 1953, 1954, 1955, and 1956

Ore	*1939*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*
Lead-zinc	774,772	1,118,590	1,203,764	1,432,100	1,484,522	1,650,178	1,726,461
Copper	983,902	1,173,199	1,264,998	1,343,563	1,298,860	1,476,863	1,740,855
Antimony	18,963	55,088	74,594	61,450	75,258	80,474	83,056
Bauxite	718,594	453,357	577,196	462,309	680,597	791,057	881,418
Chromite	44,852	99,639	107,222	126,961	124,480	126,207	118,762
Manganese	5,656	N.A.	N.A.	N.A.	N.A.	10,955	11,573
Pyrite	78,064	N.A.	N.A.	N.A.	N.A.	226,682	255,947

N.A. Not available.

OCEANIA

AUSTRALIA

Value of Australian metal production, though in 1956 five times that of pre-war years, is due mainly to price increases rather than enhanced output except in the case of the "newer" metals rutile, zircon, and uranium. The year 1956 was a most important period in Australian mining and metal extraction. A boom in rutile prospecting, resembling the 1954 "boom-and-bust" in uranium, waxed and began to wane. However, a number of vital announcements were made by responsible companies and it is evident that the Commonwealth stands at the threshold of tremendous expansion in its mining industry with particular emphasis on lead-zinc, copper, uranium, rutile, zircon, and bauxite. While interest in prospecting and scientific exploration have been widespread, it is likely that greatest developments will occur in the almost untouched tropical northern part of the continent including Cape York and Mount Isa areas (Q.), Tennant Creek, Alligator River and Rum Jungle (N.T.) and, possibly, the Kimberley district of W.A.

QUEENSLAND

One of the most spectacular announcements in Australian mining history was the confirmation, in late 1956, that Consolidated Zinc Ltd. had located high grade bauxite deposits containing perhaps 1,000,000,000 tons. These are near Weipa River on the western side of Cape York Peninsula and follow earlier satisfactory discoveries on the western side of the Gulf of Carpentaria. No rash estimates of production are being made, for it is realized that 10 to 20 years may elapse before full scale mining is possible.

Progress continued by Mount Isa Mines Ltd., Mount Isa, during the year. Large increases were reported in both copper and lead-zinc ore reserves. A subsidiary company was formed to refine blister copper at Townsville. Initial planned capacity is for 30,000 tons of copper rising to 60,000 tons in five years. It was reported that an atomic power plant will be established at Mount Isa and Government support has been promised for improvement of rail transport facilities between Mount Isa and the coast. Mining Corporation N.L., in drilling south of the leases of Mount Isa Mines Ltd., intersected what may be a continuation of the main Mount Isa ore bodies.

NEW SOUTH WALES

Rutile and zircon producers on the north coast of this state and south coast of Queensland expanded outputs under the influence of very high spot prices for their minerals and entered into forward contracts for the greater proportion of their planned production at favorable rates. Many small new producers have commenced separation of these minerals or expect to be in production before the second half of 1957. Reserves of rutile and zircon are undoubtedly very large.

Broken Hill silver-lead-zinc mining companies had a good year and reported steady progress. North Broken Hill Limited found that its ore body is larger than expected at depth. Reserves of all mines other than Broken Hill South Ltd. have indefinite life ahead. This has led B.H. South, in particular, to seek other avenues for expansion and this company will, almost certainly, reopen the Cobar copper-gold field by leases held under option from New Occidental Gold Mines N.L.

Following near-completion of its modernization program for the electrolytic refinery and casting sections, Electrolytic Refining and Smelting Company Pty., Ltd., Port Kembla, plans to modernize its smelter, thus considerably increasing capacity for custom copper materials. Substantial tonnages of copper concentrates are at present being exported from Australia, especially to Japan.

Sulphide Corporation Ltd., Cockle Creek, subsidiary company of Consolidated Zinc Ltd., will build a zinc extraction plant within the next two years. This may be the forerunner of several new Australian zinc distillation plants.

VICTORIA

No outstanding developments occurred during the year. Gold mines continued to wage a losing battle. The government wisely formed a metal committee and it is possible that its deliberations will lead to interesting results. Investigation of long-known iron deposits near Nowa Nowa was commenced on a more intensive scale than previously.

TASMANIA

Record zinc production was attained by The Electrolytic Zinc Co. of Australasia Ltd. The company will build a fourth flash roaster and increase sulphuric acid production and output of zinc. The ammonium sulphate plant has commenced production and immense expansion of all activities undoubtedly lies ahead. In conjunction with Rio Tinto (Aust.) Pty., Ltd. and Mount Lyell Mining and Railway Co. Ltd., large areas of western Tasmania are being explored. A helicopter was used to survey and land in otherwise inaccessible places.

King Island Scheelite N.L., Grassy, King Island, mined a record tonnage of ore and produced a record output of concentrates (1,521 tons). Prospects appear bright and this company has combined with others in a program of investigating likely mineral bearing areas wherever they may occur.

The Australian Government Aluminium Commission's plant at Bell Bay reached an output of 10,000 tons of metallic aluminium. It will shortly attain capacity production of 13,000 tons and later expand facilities to produce 20,000 tons of ingot per year.

SOUTH AUSTRALIA

The lead smelter of Broken Hill Associated Smelters Pty. Ltd., Port Pirie, continued at a high rate of lead and silver production. A large new Dwight-Lloyd machine producing sinter by updraught was placed in service while sulphur dioxide gas from this machine yielded acid in a new contact plant. The smelter will increase capacity as required to meet expansion of output by the four contributing Broken Hill mines.

WESTERN AUSTRALIA

Interest in titanium minerals spread to this state and the large reserves of ilmenite in the southwestern corner, near Bunbury, are being mined. Western Titanium N.L. contracted to supply ilmenite to the pigment plant at Burnie, Tasmania, and to Japan. Other producers are to begin shipments to Japan also. Current prices for ilmenite appear unlikely to leave a wide margin of profit over extraction and shipment costs, the latter being especially burdensome on the Australian coast.

Gold, the backbone of the state's mineral wealth, has declined in production. The spectacular Hill 50 mine at Mount Magnet, however, had a record year and reported the largest gold mining profit in the Commonwealth during 1956 at over £A900,000. Reserves are adequate for many years ahead.

NORTHERN TERRITORY

United Uranium N.L., operating company for Uranium Mines N.L. and Northern Uranium Development N.L., made history with a shipment of pitchblende estimated to be worth between £A600,000 and £A700,000. Proving of the El Sharana, Saddle Ridge, and other South Alligator River deposits continues to reveal occurrence of high grade ore. North Australian Uranium Corporation N.L. reported favorable developments at its Milestone area but does not intend to sell high grade ore without also mining lower grade material concurrently.

Preliminary reports of very large, low grade lead-zinc ore bodies discovered by Consolidated Zinc Ltd. near Rum Jungle have yet to be confirmed.

Tennant Creek attracted the interest of several new companies during the year. National Lead Company, New York, entered into an association with New Merloo Gold Mines N.L. Western Mining Corporation Ltd. took an option over the Lone Star leases. Both are gold ore bodies.

Excellent production figures continued to be achieved by Peko Mines N.L. whose ore reserves are over 1,000,000 tons at 8.0 percent copper.

FIJI

Gold continued the most important mineral product, with Emperor Gold Mining Co. Ltd., Vatkuola, the main producer. Total output of gold is esti-

Australian Mine Production of Metals From 1951 Through 1956

Metal	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*[1]
Gold[2]	895,536	980,400	1,075,200	1,117,700	1,049,000	1,000,000
Silver[2]	10,978,191	11,278,400	12,539,200	13,827,000	14,555,400	14,560,000
Copper[3]	12,483	18,578	36,585	40,857	45,496	52,500
Lead[3]	197,913	228,196	269,344	284,862	295,944	296,000
Zinc[3]	152,000	196,450	239,324	252,659	256,564	280,000
Tungsten[3, 4]	1,110	1,282	1,406	1,372	1,482	1,100
Tin[3]	1,459	1,611	1,553	2,075	2,017	1,900
Rutile[5, 6]	33,400	36,861	37,067	43,011	57,232	81,000
Zircon[3, 6]	———	———	———	40,920	48,209	69,000
Iron ore[3]	———	———	———	3,518,804	3,572,609	3,900,000
Sulphur[6, 7]	———	———	———	249,723	261,672	315,000

1. Estimated. 2. Fine ounces. 3. Long tons. 4. WO_3 content. 5. TiO_2 content: 6. Zircon content. 7. Sulphur content of zinc, lead, and pyrite concentrate.

mated at 80,000 fine ounces, of which the Emperor company produces some three-quarters. A vigorous mine development project was under way and joint exploration schemes were being followed with other companies.

Manganese ore production continues to increase gradually. 1956 exports were 20,000 long tons; 1957 production is expected to be 25,000 tons. The ore assays over 50 percent manganese, is low in iron and silica, and free of phosphorus. Much interest was taken in beach sand deposits and it is possible that one or two may contain workable grades of rutile. There was small scale, exploratory production of copper from the Wainivesi mine, held under option by Emperor Gold Mining Co., Ltd.

INDONESIA

Output of tin: Indonesia's chief mineral product declined in 1956 because of dredge shut-downs due to poor maintenance. Exports in 1956 were 31,874.4 long tons compared with 31,963.8 in 1955. But actual mine production was down to 30,054.7 long tons from 33,367.3 in 1955. Actual mine production in 1956 was 20,113.3 at Bangka (22,750 in 1955), 8,182 at Billiton, and 1,761.4 at Sinkep. Several Billiton dredges were being completely repaired at start of 1957.

Some manganese ore was mined on Doi, Halmahera by the Provincial government under the supervision of Perusahaan Pembangunan Pertambangan N. V. West Java continued to be the most important manganese producing area. Total Indonesian exports for the first 10 months of the year were 75,130 tons.

Bauxite production and exports continued about the same as in 1955. A regular small production of diamonds continued in southeast Borneo.

The report by the German Bureau "Wedexro" concerning iron ore mining possibilities in west and central Java, south Sumatra, and southeast Borneo was not received by year's end. Joint field work was done by Djawatan Geologi at Bandung.

Perusahaan Pembangunan Pertambangan N. V. started rehabilitation of the Tjikotok and Tjirotan gold-silver mines during the year. Production started in early 1957.

Interest in mining in Indonesia continued during the year. Progress is slow because of the lack of capital, lack of technicians, unstable working conditions, and lack of a mining law. When new mining law is in effect mining investment capital may go to Indonesia.

NEW GUINEA

Mining continues at a low ebb with even the long established gold producers fighting an uphill battle. Total gold production is estimated at a maximum of 60,000 ounces, of which Bulolo Gold Dredging Ltd. produced 40,000 ounces—in itself a decline of about 20,000 ounces from the previous year. Output of other metallic minerals was of minor importance and prospecting appears sporadic, with some interest being shown in copper deposits around the Port Moresby area.

Gravel reserves of Bulolo Gold Dredging were only 24,000,000 cubic yards at the half-year, (a decline of over 13,000,000 from a year earlier) and a further 5,000,000 yards were dredged in the remainder of 1956. It seems likely that dredging operations will cease within two years.

Dredge No. 7 capsized and sank in May. It is unlikely the dredge will be placed in operation again. However, parts will be used for No. 5 which soon will be only operating dredge as No. 4 will exhaust gravel reserves in 1957.

NEW ZEALAND

Gold dredging continued on a restricted scale, the principal dredges being at Arahura and Kaniere. There were no major exploration campaigns for minerals during the year although considerable interest has been taken in a possibly important uranium deposit at Batty Creek in the Buller Gorge, South Island. A lode of radioactive minerals 4 to 7 feet thick is of a deeply dipping nature and has been traced for a short distance. There have been intermittent reports of interest in black sands on the west coast of both North and South Islands but nothing definite has emerged. These sands are ferruginous and large reserves are available.

New Zealand Mineral Production in 1955 and 1956

Commodity	*1955*	*1956*[1]
Gold[2]	26,443	26,000
Silver[2]	27,930	1,000
Iron ore[3]	2,550	2,500
Manganese ore[3]	159	160
Tungsten ore[3]	30	30

1. Estimated. 2. Metric tons. 3. Fine ounces.

REPUBLIC OF THE PHILIPPINES

The most outstanding development in Philippine mining in 1956 was the rise of copper to the position of number one mineral product, surpassing gold in point of value of production.

The increase in milling capacity of one big copper producer and the start of production of two medium-sized mines accounted for the rise in copper output.

Gold had been the principal mineral production for many years. Philippine gold mining reached a record output in 1940 to rank the country as number five in world production.

Base metal production registered an overall increase in value of 26,300,000 pesos or 34.9 percent over the output in 1955. Combined production was valued at 101,721,605 pesos, compared with the total value of 75,599,021 pesos in 1955.

Copper production in 1956 amounted to a total of 26,963 metric tons of estimated metal content of concentrates and ores produced, showing a gain of 9,502 tons or 54 percent over the 1955 output of 17,461 tons. In value the 1956 production was reported at 47,073,079 pesos, registering an increase of 17,277,683 pesos or 58 percent over output valued at 29,795,396 pesos in 1955. The two big mines; Atlas Consolidated Mining and Development Corporation, and Lepanto Consolidated Mining Company dominated copper output. A large part of increase was due to Atlas expanding mill tonnage.

Prospects for further increase in copper production during 1957 are bright. Atlas Consolidated was treating 7,500 tons a day at its Toledo property in Cebu at year's end and is expected to complete the increase in capacity of the mill to 10,000 tons about the middle of 1957. Lepanto Consolidated treated well over 1,200 tons a day at its Mankayan mine, Mountain Province, and started active exploration work on another property in Agusan, Mindanao Island.

Mindanao Mother Lode Mines, Inc., should increase its production at the Cabapa copper mine, in Zambales, where the mill is expected to operate at full capacity of 400 tons a day in 1957 as more mine workings are opened. The 4,000-ton mill at the Sipalay copper mine, in Negros Occidental, owned by Marinduque Iron Mines Agents, Inc., started trial runs in March 1957. Hixbar Mining Company, Inc., is completing the construction of its 275-ton mill on Rapu-Rapu Island, off Albay Province in southeastern Luzon.

Philex Mining Corporation completed plans to construct the first 1,000-ton unit of its 3,000-ton mill. The copper property of the company is located in Santo Tomas, Mountain Province, and has ore reserves of 20,000,000 tons averaging 1.5 percent copper.

Other copper properties being worked are located in Milagros, Masbate Island and on Marinduque. Marinduque Iron Mines Agents, Inc., also developed the Bagacay property on Samar where it started shipping high-grade ore to Japan which grossed the company more than 3,000,000 pesos in 1956.

Gold production showed a small drop in quantity but there was an increase in value due to a higher price in the local open market. Gold output totalled 406,163 ounces, compared with 419,112 in 1955, showing a decrease of three percent. The value of production was reported at 44,580,451 pesos, compared with the previous year's value of 43,860,071 pesos, based on the yearly average price of 109.76 pesos per fine ounce in 1956 and 104.65 pesos in 1955.

Normal operations in gold mining are expected to continue during 1957. Benguet Exploration, Inc., in the Baguio district, is scheduled to start operations of a 50-ton mill now under construction. The property, which is under the operation and management of Philex Mining Corporation, is reported to contain high-grade ore with appreciable amount of zinc and some copper.

The Itogon-Suyoc Mines, Inc., a merger of Itogon Mining Company, Suyoc Consolidated Mining Company, and Palidan-Suyoc Deep Level Tunnel Company is completing the installation of additional machinery to increase its Itogen mill capacity from 500 to 650 tons a day. The company is also reopening the Suyoc mine.

The Masara gold mine, in Davao, owned by Samar Mining Company, is completing the installation of additional machinery to increase the capacity of its mill from 250 to 400 tons a day. The mill recovers copper, lead, and zinc as byproducts.

Benguet Consolidated, Inc. acquired all the assets of Balatoc Mining Com-

pany. While the consolidation of the two mines, which mills their ore in one central plant, under one operating company does not necessarily mean increased output in the future, the operation should result in lower costs.

Production of both refractory and metallurgical grades of chrome ore increased both in quantity and value. The 1956 total was 701,031 metric tons with a value of 27,790,875 pesos, compared with the previous year's output of 595,007 tons with a value of 19,420,108 pesos.

Refractory grade production came from only one mine, Consolidated Mines, Inc., whose property in Masinloc, Zambales Province, is operated by Benguet Consolidated, Inc. Total shipments last year amounted to 581,685 tons with a value of 20,323,880 pesos, compared with the 1955 shipments of 535,262 tons valued at 16,145,280. There was a gain of 8.7 percent in volume and an increase of 25.9 percent in value.

Some 87 percent of the total output of metallurgical grade chrome ore was supplied by the Acoje Mining Company, Inc., also located in Zambales Province. Total production was reported at 127,370 tons with a value of 7,461,995 pesos, showing an increase over the 1955 production of 59,745 tons with a value of 3,274,828 pesos.

In chromite mining, expansion in operations at the Consolidated Mines, Inc., and Acoje Mining Company are indicated for 1957. A new mine, Palawan Consolidated Mining Company, on Palawan Island, has possibilities of developing into a major producer of high-grade metallurgical chromite in the future. It is expanding operations and completing loading facilities in anticipation of increased production.

Production of Metals and Ores in the Philippine Islands for the Years 1950, 1951, 1952, 1953, 1954, 1955 and 1956

Commodity	*1950*	*1951*	*1952*	*1953*	*1954*	*1955*	*1956*[1]
Gold[2]	333,991	393,602	469,408	480,625	416,052	419,112	406,163
Silver[2]	216,034	274,602	693,751	572,046	502,069	—	541,168
Chromite[3]							
Metallurgical	41,846	32,736	52,364	88,541	62,595	59,745	127,370
Refractory	208,665	301,835	491,150	468,549	388,590	535,262	581,685
Iron ore[3]	599,095	903,282	1,170,153	1,217,864	1,424,898	1,432,712	1,440,232
Copper[2]	10,384	12,712	13,264	12,715	14,349	17,461	26,963
Manganese ore[3]	29,867	22,343	20,627	21,508	9,393	11,912	4,414
Lead[2]	879	571	2,300	2,434	1,827	2,318	2,140
Zinc[2]	—	155	1,596	747	—	—	950
Mercury[4]	—	—	—	—	—	635	3,015

1. Estimated. 2. Fine ounces. 3. Metric tons. 4. Flasks (76 pounds).

There was a small gain in iron ore production but the value showed a slight drop due to lower prices reportedly offered by Japanese steel mills. Total production amounted to 1,440,232 tons with a value of 23,201,119 pesos, compared with 1,432,712 tons valued at 24,039,909 in 1955. There were four major mines producing iron ore which make regular monthly shipments to Japan, while a small mine reported sporadic output during the year.

The outlook for iron ore is not exactly discouraging despite the decline in production registered by two producers in 1956. The biggest mine, Philippine Iron Mines, Inc., is expected to complete its 6,000-ton beneficiation plant which should increase output as well as prolong the life of the mine. Atlas Consolidated is also expanding operations at the Mati mine, in Davao, and expects to double shipments. Samar Mining Company, Inc., which showed a drop in output at its Camcueves mine on Samar Island, has reported progress on its development work at the Sibuguey iron property in Zamboanga, Mindanao Island. Another property in Zamboanga and one on Palawan Island are being explored.

Development work during the year has indicated that Palawan Quicksilver Mines, Inc. is one of the world's important mercury mines. A second Gould rotary kiln was placed in operation to double furnacing capacity. Palawan reported total production of 3,015 flasks of 76 pounds each with a value of 1,567,864 pesos. Production of 635 flasks valued at 357,470 pesos was only for the second half of 1955 as the mine started operations in July of that year.

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AFRICA

ALGERIA

Mineral production in Algeria felt the effects of the political crises during the year. Zinc output showed a slight increase, but other minerals more or less declined in output.

The production of iron ore dropped about 500,000 tons, from 3,100,000 tons in 1955 to 2,600,000 tons. Difficulties in transportation have considerably impeded development work.

Thanks to the development of the Zellidja group, zinc production rose from 54,000 tons to 57,000 tons. Sphalerite remains the principal mineral extracted.

Production of lead remained at about the same level—14,500 tons. There was a slight decline in phosphate output from 780,000 tons to 600,000 tons. The shutdown of pyrite mining was announced last year. However, a small quantity of 6,000 tons was extracted in 1956.

Although production of antimony reached 6,000 tons in 1956 as compared with 3,000 tons in 1955, it still has not returned to its former rate which was more than 8,000 tons in 1954.

Regularly interrupted during 1955, production of copper was resumed in 1956. Output totaled 600 tons, compared with 300 in the previous year.

BECHUANALAND

No new mining ventures started in the Protectorate during 1956, though mining companies continued to show an active interest in the potential mineral resources with particular reference to the copper deposits of the Bushman area northwest of Francistown, and the nickel occurrence at Magophate in the northeastern Bamangwato Reserve.

In the Tati Concession area, where the mineral rights are owned by the Tati Company Limited, a prospecting program was being carried out by a Johannesburg mining group.

The Anglo American Corporation of Africa Ltd., as technical advisers to De Beers Consolidated Mines Ltd., carried out prospecting in the Tuli Block farming areas where the mineral rights are owned by the British South Africa Company.

A gravimetric survey of the Protectorate, undertaken in collaboration with the Geological Survey of the Union of South Africa was completed in July. The results of this survey are still awaited.

Kyanite was produced at the Halfway Kop, 10 miles southeast of Francistown in the Tati Concession where small amounts of gold (590 ounces) and silver (215 ounces) were won from small workings similar to those found in the schist belt of Southern Rhodesia.

The asbestos (1,356 short tons) was all produced from the Moshaneng mine near Kanye in the Bankwatetse Reserve.

BELGIAN CONGO

For more than 20 years, the Belgian Congo has been the largest producer of diamonds (in quantity, not in value), with more than 60 percent of world production being mined here. Output in 1956 was no exception. The country produced 14,000,000 carats last year, in contrast with 13,041,487 in 1955. Much of this 7.7 percent increase was due to the increased mechanization attained at the Bakawanga mine of the Societe Minière du Beceka. About 13,380,000 carats were mined at Bakawanga in 1956, compared with 12,413,198 carats in 1955; about 98 percent are industrial diamonds.

On the Kasai alluvial fields, where mining operations are carried out by the Forminière Company, the output during 1956 remained at approximately the same level; it amounted to about 627,000 carats. This production contains a higher percentage of gem stones—30 to 35 percent.

Belgian Congo export figures reflected higher production in 1956. Copper, cobalt, manganese, and zinc metal tonnages all increased on the export market. Copper exports totaled 253,936 metric tons, compared with 230,770 in the preceding year; cobalt exports were 14,526 metric tons, compared with 12,244; manganese ore, 341,767, compared with 274,493; and zinc metal rose to 40,765 metric tons, compared with 33,228. Tin ore exports decreased in 1956 from 17,768 metric tons to 16,419, and zinc ore dropped from 103,074 in 1955 to 71,588 in 1956.

Belgian Congo joined the list of beryl producers last year, producing good supplies. This was achieved soemwhat by Derby & Company Ltd. which encouraged its tungsten mining groups to produce beryl. In the adjoining Belgian Territory of Ruanda-Urundi, beryl output for the first six months of 1956 showed a tremendous increase from 68 metric tons in the first half of 1955 to 767 metric tons in the same period of 1956.

Union Minière du Haut Katanga celebrated its 50th anniversary in 1956. With more power available through completion of Le Marinel power station, copper production reached an all-time high. During the year, work started on construction of the Luilu Works which will be one part of the Kolwezi-Luilu copper-cobalt hydrometallurgical plants scheduled for operation in 1959.

Geomines, the country's largest producer of tin, produced 4,007 tons of cassiterite compared with 3,804 in the previous year, and 200 tons of tantalite-columbite, compared with 225 in 1955. The firm has been studying the possibility of erecting a plant to produce lithium carbonate on an industrial scale at Manono. The plant would treat spodumene which is a byproduct in its cassiterite-tantalite-columbite ore. A successful pilot plant operation was carried on in Belgium.

Toward the end of the year, a syndicate of leading Belgian financial interests was formed to prepare plans for a large-scale aluminum plant in the Belgian Congo. This is part of an overall plan for using the potential reserves of electric power available on the Congo River at Inga where a hydroelectric plant would be erected. The bauxite would be imported from the Guiana coast.

EGYPT

The year 1956 was a marked era in the history of mining in Egypt. First, for the promulgation of the new mining law—No. 86/1956—which improved upon the old law in several respects and also abolished royalties. Secondly, the military campaign in the Sinai Peninsula resulted in the stoppage of production and shipments from many important properties, and also caused considerable damage to certain installations at the mines.

Production and shipments from the mines of Egypt during 1956, therefore, represent only 10 months, since activities were either completely stopped, or seriously curtailed by military action. Nevertheless, the rates of production, as well as shipments from the various producing mines were substantial as the following figures indicate. Low grade manganese production was 181,327 tons, shipments were 205,129. High-grade manganese output was 18,480 and 7,442 tons were shipped. Phosphate, 610,546 with 359,-119 shipped. Gold output was about 6,300 ounces.

Aswan iron ore was continuously mined, and steps were taken towards the installation of a beneficiation plant at Aswan to raise the average grade.

An important development was the opening up the sulphur mines at Gemsa, on the Red Sea coast, where prospecting and development proved the economical possibilities of the mines. Steps were taken to mine the deposit on a scale of 100 tons of pure sulphur per day. This deposit was developed in conjunction with the manufacture of sulphuric acid and amonium sulphate fertilizers, and it is hoped that the whole scheme will be completed early in 1958.

The second important development during the year was the opening of the Abu Ghalaga ilmenite deposit. It is gratifying to note that the ore proved of substantial potentialities, and the necessary measures for its production were underway.

FRENCH EQUATORIAL AFRICA

The production of gold continued to drop in 1956. 1,266 kilograms were produced, compared with 1,450 in 1955. The mining of columbite-tantalite was not carried on during the year.

Diamond production totaled about 145,840 carats, an increase of 10,000 carats over 1955. Most of this came from l'Oubangui-Chari where some interesting discoveries were made in 1956.

The Middle Congo exported lead concentrates containing 54 percent Pb during the year. The production was lower, with 5,700 tons produced compared with 6,400 in the previous year. Equipping of the new Hapilo mine was carried on during the year, and this is expected to take the place of the M'Fouati deposit which is being depleted.

The French Overseas Mining Bureau investigated copper deposits in the Niari region where new indications were discovered. Geochemical prospecting will check the discoveries more thoroughly.

It was decided to proceed with mining of the manganese deposit at Franceville and work will start soon.

GHANA

The mining industry is second only to cocoa in importance to Ghana. Matters came to a head early in 1956, when, as a result of a prolonged strike by African miners for an increase in wages, the government appointed a Board of Enquiry whose report was favorable to the mining industry. A regrettable result of the strike was the closing down of Taquah and Abosso Ltd., upon which the population of Abosso depended for its livelihood. Because of this, the Prime Minister, Dr. Nkrumah, announced that the government had decided to make an annual grant of £100,000 for two years to assist four low grade gold mines, because it would have a disastrous effect on the national economy if these mines were to suffer the fate of Taquah and Abosso.

The Ghana Chamber of Mines has been informed that the government intends to introduce early legislation for the substitution of a form of income tax for the existing minerals duty—a move which would benefit the entire mining industry.

At four of the gold mines, Ghana Main Reef Ltd. (previously Gold Coast Main Reef), Ariston Gold Mines (1929) Ltd., Ashanti Goldfields Corporation Ltd., and Konongo Gold Mines Ltd., the geological conditions are such that low cost methods of mining are largely inapplicable and a system of mining that entails the replacing of the ore extracted by waste materials must, in nearly all cases, be adopted. At Bibiani (1927) Ltd., and Amalgamated Banket Areas Ltd., experiments with low cost methods of bulk mining resulted in a reduction of costs.

As far as the outlook of the gold mining companies is concerned Ashanti Goldfields Corporation Ltd. and Amalgamated Banket Areas Ltd., have an assured future but for the four remaining underground mines, the position is less certain. Konongo Gold Mines Ltd. has ore reserves sufficient for six years production and the mine's future is dependent on one ore body continuing in depth, unless new ore bodies can be discovered but the history of other ore bodies at Konongo is that they tend to fade out at depth. Bibiani (1927) Ltd. has 5½ years' reserves available but recent development has been disappointing.

Consolidated African Selection Trust Ltd., is the largest diamond concern but there are four smaller diamond mining companies; Akim Concession Ltd. (assisted by Consolidated African Selection Trust), Cavco (London Ltd., Holland Syndicate (N.V.), and Offin River Estates Ltd. All five companies are confronted with the grave problem of illicit diamond mining.

Consolidated African Selection Trust Ltd., have, with the present pattern of mining, proved ore reserves for 15 years of operation but considerable areas of diamondiferous ground are known to exist outside the already prospected areas and the company is considering spending £1,500,000 with a view to enlarge Ghana's diamond development.

The African Manganese Company Ltd. was the only operating manganese mining company. It was not concerned in the dispute of African workers and during 1956 the rate of production was considerably increased.

The British Aluminum Company Ltd. was the only company mining bauxite. As the deposit is all above ground, the total amount of ore available can be estimated, but the proportion of ore that can actually be mined depends upon the grade of ore that can be shipped. There are two deposits but only one was mined.

MADAGASCAR

As forecast in this section of the Yearbook last year exports of Madagascar graphite to commercial users increased. This forecast was confirmed by the exports of 10 tons of grains and 6,000 tons of graphite powder in 1956. Total production reached 14,250 tons; an increase over the projected 12,000.

The production of mica also increased considerably. Output was 430 tons compared with 270 in 1955. Accumulated stocks permitted export of a much larger quantity—600 tons.

The production and export of other minerals such as beryl and quartz crystals declined. There was about 150 tons of monazite mined during the year.

MOROCCO

Except for a few special cases, Morocco's mining production in 1956 has, on the whole, progressed. A new record in the production of phosphate has been especially observed, as well as a distinct rise in the mining of iron and barite.

Modernization of the phosphate installations at Kouribga continued to show their advantages. The production which had already increased in 1955 to 4,077,000 tons, rose further in 1956 to 4,257,000. The output of the Louis Gentil mines rose from 1,252,000 to 1,265,000 tons in 1956. Therefore, the entire production was 5,522,000 tons compared with 5,329,000 in 1955.

Exports increased from 5,250,000 tons in 1955 to 5,518,000 in 1956. The principal shipments were made to the following countries: Italy 802,000 tons (758,000 in 1955); France 753,000 (671,000 in 1955); Great Britain 740,000 (682,000); Germany 486,000 (486,000); Spain 485,500 (439,000); Belgium 388,000 (333,000); and South Africa 346,000 (340,000).

Moroccan lead production decreased from 122,000 to 120,000 tons in 1956, the Societe des Mines Zellidja and L'Asturienne remaining, by far, the most important producers. Zinc production went down from 78,000 tons to 71,000 tons in 1956. Most of this zinc ore—69,400 tons—was exported to France.

The lead smelters shipped 20,000 tons of lead bullion to France, 5,000 tons to the United States, and 2,500 tons to Algeria. They also produced 16,000 kilograms of silver in ingots which was sold to France, and 6,000 kilograms of silver in scrap which was sold in Morocco.

In spite of the continued insecurity in South Morocco, the manganese mines were able to maintain production. Output rose from 371,500 tons to 383,000 in 1956.

France remains the largest buyer of metallurgical manganese, with 246,000 tons purchased in 1956 as compared with 227,000 in 1955. The United States reduced its purchases from 86,000 tons in 1955 to 69,000 in 1956; however, the figure is still higher than the amount purchased in 1954. An increase in shipments to Norway was noted, with 24,000 tons shipped compared with 7,000 tons in 1955. Germany purchased 9,000 tons, while Italy reduced its purchases.

The export of chemical grade manganese totaled 35,000 tons, 20,000 tons of which went to France and 11,000 tons to the United States.

Barite production, which had already made records in 1955 with an output of 24,600 tons, rose to 29,600 tons in 1956. Germany purchased 18,000 tons, Great Britain 6,000 tons; while sales in Morocco only totaled 2,000 tons.

After a troublesome year in 1955, partly caused by the political situation, production of Moroccan iron ore made a good recovery. Output rose from 310,000 tons in 1955 to 490,000 in 1956. Exports were as follows: Great Britain 408,500 tons; Germany 55,700; and Austria 2,800. Iron pyrite output dropped from 4,000 tons in 1955 to 1,500 tons in 1956. This was all consumed locally.

The Bou-Azzer mine reduced its cobalt output to 6,500 tons from 7,500 tons, primarily because it is located in a zone still disturbed by political disorders. France received 5,100 tons of this, and Belgium 1,700 tons. The Bou-Azzer ore contains about 10 percent cobalt.

Production of copper ore was maintained at about 2,500 tons, which came almost entirely from the Azegour mine. All of the output went to Germany. Tungsten production was resumed at Azegour, after being almost exhausted in 1955, and resulted in an output of 3,800 tons.

MOZAMBIQUE

During 1956 marked progress was noted in mining in Mozambique.

Companhia Mineira Lillas (Lillas Mining Company Incorporated) conducted intensive and systematic prospecting in its concessions. As a result, in the Tete concession very important and extensive iron-titanium ore deposits were found. The iron ore is believed to be a direct segregation from the gabbro-dioritic

Ghana Mineral Exports and Value in 1952, 1953, 1954[1], 1955[1], and 1956[2]

Commodity	1952 Quantity	1952 £ Value	1953 Quantity	1953 £ Value	1954 Quantity	1954 £ Value	1955 Quantity	1955 £ Value	1956 Quantity	1956 £ Value
Bauxite[3]	74,368	£137,581	115,075	£201,283	156,956	£276,258	117,072	£193,985	140,993	£127,850
Manganese[3]	704,192	8,332,847	745,990	8,722,222	423,038	4,812,690	455,075	4,699,296	639,786	4,470,263
Gold[4]	711,096	9,178,889	730,155	9,390,584	724,703	9,995,506	682,273	8,531,322	620,194[6]	4,218,896
Diamonds[5]	2,051,496	5,547,026	2,165,345	3,667,206	1,963,670	3,719,712	2,278,660	4,886,345	2,531,094	4,812,121

1. First 11 months. 2. First 8 months for value only. 3. Metric tons. 4. Troy ounces. 5. Metric carats. 6. Mine production.

complex, which surrounds it. Outcrops cover an area of approximately 200 square kilometers and residual boulders of up to 100 tons are not infrequent. Late in the year important and very promising copper deposits in a limestone-dolomite-schist belt adjoining the huge iron ore deposits of the Massamba-Machedua-Moatize area were discovered. Malachite, azurite, and cuprite stain the surface of this dolomite belt for many kilometers. Ancient workings for copper in this deposit were found, but their age could not be determined.

In the eastern part of the concession, also adjoining the iron ore and the gabbro-diorite-anorthosite complex, important coal deposits were also discovered in the Karroo sediments in the Moatize area. Cokeable coal is of excellent quality. The railroad line from the port of Beira to Moatize serves the Tete area. The railroad's projected extension to the northwest will make practically all the iron, copper, and coal deposits close to the railroad for shipment. Also, transportation will be available for any future iron and steel center.

The Portuguese government granted to Central Mining and Investment Company, a South African mining and financing concern, a smaller concession in the Tete area adjoining the Companhia Mineira Lillas. Its principal interest is copper. The Cementation Company of Rhodesia undertook a drilling program for Central Mining on the extension of the dolomite-limestone belt of the Lillas, with promising results.

Companhia Carbonifera de Mozambique, an old established coal mine in Moatize, increased daily production to 700 metric tons. All the coal is railed to Beira, where the supplies are distributed to various shipping lines and the railways. This mine is the only coal mine in Mozambique.

In the southeastern part of Mozambique, Companhia Mineira Lillas has another concession, approximately 100 miles distant from the port of Beira and traversed by the important railway line from Beira to the Federation of Rhodesia. Geologically different from the Tete concession it consists principally of pegmatites, greissen, gneisses, and granites of different ages. Pegmatites are very large; are often mineralized and deeply decomposed forming interesting residual deposits sometimes rich in cassiterite and associated minerals. Intensive prospecting continues to yield very promising results.

NIGERIA

The price of tin remained at a consistently higher level than during 1955 and this, in conjunction with a diversion of effort from columbite mining, resulted in an increase in production of tin ore and concentrates in Nigeria from 11,399 tons in 1955 to 13,364 tons in 1956. The International Tin Agreement came into force on July 1st, 1956 and Nigeria completed its initial contribution of £551,040 to the buffer stock.

A controlling interest in Tin & Associated Minerals Ltd. was acquired by Kennecott Copper Corporation which investigated the possibility of the columbite market with a view to mechanize and enlarge the Odegi mine. Kennecott Copper also considered the development of thorite as a byproduct from the Odegi mine.

Amalgamated Tin Mines of Nigeria Ltd., and its subsidiary Keffi Tin Company Ltd., installed additional equipment in their Geological Laboratory and extensions have been added to their mineral dressing research laboratory. This has helped to improve recovery from the plant treating decomposed granite.

The Jantar Nigeria Company Ltd., completed its development shaft down to its final depth of 183 feet and were driving under the wash from this shaft in order to drain the area sufficiently to enable the work to be carried out from another shaft.

All contracts for the delivery of columbite to the United States Government, at bonus prices, were completed by December 31, 1955 and, in view of this, producers had to find buyers wherever they could. A substantial tonnage was, in fact, exported on consignment without a fixed final price. Revenue from columbite sales in 1956 were £1,762,135, which is only 34 percent of the income obtained during 1955, whilst production had fallen to 2,406 tons, which is 79 percent of the previous year's output.

The lead-zinc deposits near Abakaliki in Ogapa Province of the Eastern Region were investigated by a consulting engineer for the application of a special mining lease held by the Nigeria Lead-Zinc Mining Company Ltd. Work was mainly confined to the 150 and 250 foot levels at Amari which appeared to be the most interesting and promising prospect.

There were a total of 153 mining operations during the year and their combined labor force amounted to 60,249.

Nigerian Mineral Exports and Values for 1953, 1954, 1955, and 1956.

Commodity	1953 Metric Tons	1953 £ Value	1954 Metric Tons	1954 £ Value	1955 Metric Tons	1955 £ Value	1956 Metric Tons	1956 £ Value
Tin	12,136	7,078,014	10,309	5,170,344	11,399	5,868,474	13,364	7,297,490
Columbite	1,855	3,698,043	2,524	5,127,613	3,046	5,166,927	2,406	1,762,135
Tungsten	14	15,735	7	4,470	3	2,153	5	4,267
Lead	—	—	154	10,034	73	3,963	105	8,450
Zinc	—	—	125	3,375	—	—	—	—
Tantalite	—	—	5	13,725	9	9,692	15	20,266
Other Ores and Concentrates	—	—	—	—	—	—	749	29,525
Coal	—	—	—	—	99,976	261,032	98,393	277,441

NORTHERN RHODESIA

Expansion of the copper mining industry continued throughout 1956 and boom conditions were maintained with throughput, output, and profits all establishing new records. The very high copper price over the first part of the year was mainly responsible for the spectacular increase in earnings but, despite a heavy recession in copper prices over the latter part of the year, the outlook for the industry remains very bright.

Labor relations between the African employees and the companies rapidly degenerated early in the year and various irritation tactics, including rolling strikes, were instigated by the African Mineworkers' Union in efforts to embarrass the mining companies. Conditions finally deteriorated to such an extent that the whole economy of the country was threatened with disruption. A state of emergency was declared by government and striking African employees were ordered back to work. Subsequently, a Commission of Enquiry into Causes of Unrest on the Copperbelt was appointed and established that the unrest was largely fomented by the African Congress which is an African political group with an aggressive racial policy. Conditions returned to normal by the end of September. An Arbitration Court held sittings in October to hear substantial wage increase claims made by the African Mineworkers' Union. No award was made, as the Court found that the conditions of employment, and wages paid to Africans on the Copperbelt, are superior to those in any other part of Southern Africa.

Electric power, which has been in critical supply for a number of years and which threatened to restrict expansion on the Copperbelt, was assisted by the importation of power from the Belgian Congo over a transmission line completed in the latter part of the year.

Metal and Mineral Production In Northern Rhodesia In 1954, 1955, and 1956, and Value In Rhodesia Pounds.

Commodity	1954 Quantity	1954 Value £	1955 Quantity	1955 Value £	1956 Quantity	1956 Value £
Gold[1]	178	2,185	362.5	4,525	3,329.42	41,067
Silver[1]	38,279	11,623	109,130	34,964	609,107	191,285
Cobalt[2] (metal)	11,762	1,383,218	8,228	967,649	16,442	1,928,900
Cobalt[2] (alloy)	21,267	965,206	7,464	291,030	2,416	110,478
Cobalt[2] (other)	3,347	169,744	5,744	297,944	7,061	357,728
Copper[3] (blister)	204,975	48,007,900	165,074	52,230,345	157,531	47,271,095
Copper[3] (concentrate)	1,064	40,308	973	45,919	584	29,659
Copper[3] (electrolytic)	173,636	43,132,746	177,098	61,659,741	225,953	73,729,521
Copper[3] (other)	—				70	19,805
Iron Ore[3]	961	961	2,164	2,164	—	
Lead[3]	15,000	1,445,688	16,050	1,700,247	15,200	1,768,495
Manganese Ore[3]	16,754	128,046	17,331	204,424	39,438	491,422
Selenium[4]		—			32,712	121,764
Zinc[3]	26,550	2,075,193	27,900	2,529,839	28,925	2,828,266
Beryl[3]	1.25	178	17.64	2,505	12.34	1,531
Limestone[3]	—	—	304,590	333,290	367,046	371,997
Mica (sheet)[4]	6,464	808	4,557	570	5,821	1,455
Phylite[3]	—	—	—		4,215	632
Amethyst[4]	—	—	—		3,128	120
Cadmium[3]	—	—	—		52	69,721
Tin[3] (concentrate)	1.47	587	—			
Total Value		£97,507,961		£120,305,156		£129,334,941[5]

1. Fine ounces. 2. Hundredweight. 3. Long tons 2,240 pounds. 4. Pounds. 5. Preliminary subject to adjustment.

The huge Kariba hydroelectric scheme, on the Zambesi River between Northern and Southern Rhodesia, was finally approved and substantial construction progress was made. Completion of this scheme will ensure that the Copperbelt has ample power supply for anticipated future expansion.

Copper production continued to dominate the mining scene although important contributions of lead, zinc, and vanadium were made by the Broken Hill Development Company. The latter company was also responsible for the first production of cadmium metal in Northern Rhodesia. Plant extensions and modernization were underway at all the existing mines, a new mine started producing, and another large property was almost ready for production by the year end.

Active development at Nchanga Consolidated Copper Mines Ltd.'s upper Nchanga ore body for open pitting proceeded throughout the year and ore is to be delivered to the concentrator early in 1957. The normal capacity of the concentrator is 280,000 tons per month but this is to be increased 25 percent by the addition of two more grinding units and additional flotation capacity.

Rhokana Corporation, Ltd. is currently mining and milling about 360,000 tons of ore per month and, in common with other Copperbelt concentrators, is experimenting with hydrocyclones as classifiers in the grinding circuit.

Anglo American Corporation of South Africa, Ltd. operating through its subsidiary, Kansanshi Copper Mining Company, Ltd. continued to carry out investigational and exploratory work at Kansanshi, an old pioneer property situated to the west of the main Copperbelt and close to the Belgian Congo border. A small treatment plant was erected. The same interests are also looking over the old Bwana Mkubwa mine which ceased operations in 1931 after running into difficulties in treating an oxide copper ore by an "ammonia-leach" process.

The rich Bancroft mine of the Anglo-American group has had some trouble with mud underground but initial development has been completed and the mine entered the list of producers early in 1957. Installed plant capacity is about 150,000 tons of ore per month but plans are to double this in the near future. Single stage grinding is provided for and this will be the first concentrator on the Copperbelt to use hydrocyclones, only, for classification. Automatic tonnage control has been provided for and instrumentation has received considerable attention.

Mufulira Copper Mines Ltd., of the Selection Trust group, increased its milling rate and now has 16 grinding units, handling some 400,000 tons of ore per month. Present plans call for about a 50 percent increase in output from Mufulira and this will involve the construction of another separate concentrator.

Chibuluma Mines Ltd., another Selection Trust property, went into production in May and had the distinction of being the first Copperbelt mine to start since the war. This is a copper-cobalt mine situated about 10 miles from Nkana and initial throughput will be some 45,000 tons of ore per month.

Roan Antelope Copper Mines Ltd. also completed the larger part of a comprehensive plant extension program and throughput was stepped up to 500,000 tons per month, which is substantially the highest tonnage rate on the Copperbelt. An anode casting section has been added to the smelter in anticipation of the opening of the Roan subsidiary, Ndola Copper Refineries Ltd., in the near future. A cobalt recovery plant is also being erected adjacent to the refinery for the treatment of cobalt concentrate from Chibuluma.

The Chambishi mine, a Selection Trust property situated almost midway between Nkana and Nchanga, is again receiving attention and present intentions are to open it up on about the same scale as Chibuluma, when satisfactory financing can be arranged.

A small amount of concentrate is being produced by the Mtuga copper mine which is about 60 miles from Kapiri Mposhi on the main railway line. Active prospecting continues over a large area of the Territory and there are big drilling programs, both by present producers and by outside interests.

Outside the Copperbelt the Geological Survey Department investigated the carbonatite deposits of the Feira district discovered in 1956. The area contains at least four major pyrochlore bearing ring structures or carbonate plugs, and numerous minor vents, and associated dikes.

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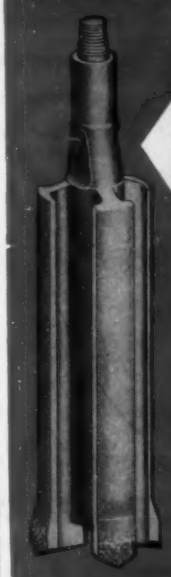

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There was considerable activity in manganese on behalf of the Rhodesian Vanadium Corporation, Gypsum Industries, Weedon's Minerals, and other parties. Extensive deposits were located in the northeast part of the country, but development was impeded by the difficulties involved in crossing the Congo pedicle.

Rhodesia Broken Hill Development Ltd. commenced the production of cadmium (116,200 pounds) in addition to output of 28,900 long tons of zinc and 15,200 long tons of lead.

NYASALAND

This territory has no mines and no mineral production, but was the scene of great prospecting activity, fostered and assisted by the Geological Survey Department.

Of particular attraction were the radioactive monazite sands around the shores of Lake Nyasa, following the original discovery made near Monkey Bay in 1955. Monazite bearing sands were also located on the east shore of Lake Nyasa, and to the south of Lake Chiewa.

Deposits of uranium bearing minerals including davidite and betafite were discovered in the Tambani area to the west of the Middle Shire Valley, but it is not yet known whether they will prove to be of economic importance.

During 1956 investigations were initiated by the Anglo American Corporation of South Africa, Ltd. on the apatite deposits of Tundulu Hill discovered by government geologists in 1955. It is hoped to overcome transport difficulties and to be able to supply the new fertilizer factory to be erected in Salisbury, Southern Rhodesia, from this source.

Other prospects awaiting exploration and possible exploitation are the vermiculite deposits near Mpatamanga west of Blantyre, and the Chilwa Island pyrochlore. The latter was taken over by Rhodesian Selection Trust, Ltd. from the former holders, London Tin Corporation, Ltd.

New Consolidated Gold Fields, Ltd., hold a large area in the Central Province from the British South Africa Company, co-owners of the mineral rights, and located radioactive minerals.

In 1957, intensified prospecting will take place, but it will be some time before mining operations are commercial at the various deposits under examination.

SIERRA LEONE

Iron ore is the leading Sierra Leone export and the value of 988,660 tons shipped during the first nine months of 1956 was just under £3,000,000. In the preceding year a total of 1,331,573 tons were exported and this brought £3,709,595.

Sierra Leone Development Company Ltd. plans a project which aims for a iron ore production four times greater than the curent output by mining the deposits at Tonkolita. Work was due to commence in 1956, but was postponed owing to the need for further prospecting.

Until a new agreement was signed with Sierra Leone Selection Trust Ltd., late in 1955, limiting its area of operation, that company had the legal monopoly of diamond mining throughout the Colony. The agreement was followed up with legislation and licenses were being issued to diamond miners. The Diamond Corporation set up a buying agency and in this way it was hoped to put an effective check on the ever-growing scale of illicit digging and, above all, illicit exporting.

About 600 licenses were issued and in an effort to drive the miners away from the smugglers, the Corporation was offering very attractive prices as practically demonstrated by the fact that the 1956 average price per metric carat was 113 shillings whereas the comparative price for 1955 was only 70. Due to this price lift, revenues from recorded diamond sales for the first nine months of 1956 amounted to £2,708,620 while the total income from diamonds during 1955 was only £1,400,478. However, it is estimated that unrecorded diamond exports, that is to say, the value of smuggled stones amounted to £7,000,000 during 1956 alone. Official production during the first nine months of 1956 amounted to 478,627 metric carats and by way of comparison, the total diamond output during 1955 was 418,077 metric carats.

Sierra Leone Chrome Mines Company Ltd., were the sole chrome mining concessionaries and the position regarding production and exports showed little change. During the first nine months of 1956 the company's output amounted to 14,237 tons (20,742 tons for the whole of 1955).

SOUTH WEST AFRICA

Interest in South West African mines and minerals reached a new high in 1956. Both South African and internationally financed companies sought to acquire control of operating companies, concessions, and claims.

Competitive bidding developed for control of the South West Africa Co., which produces vanadium-lead-zinc concentrates and owns extensive mineral rights in the Grootfontein area, to the southeast of Tsumeb. Tsumeb Corporation, Ltd., a major producer of lead-copper-zinc concentrates and increasing byproduct output of germanium, offered Tsumeb shares and cash for the S.W.A. Co. shares. The Anglo American and Consolidated Gold Fields groups and the British South Africa Company offered cash for a controlling shareholding in the S.W.A. Co.

Consolidated Diamond Mines of South West Africa extended its operations and expanded output further, substantially increased its diamond reserves, continued its plant modernization pro-

Production Sales and Sales Value* of Important Metals and Minerals Produced in South West Africa in 1954, 1955, and 1956

Commodity	*1954 Production*	*1954 Value*	*1955 Production*	*1955 Value*	*1956 Production*	*1956 Value*
Diamonds[1, 2]	683,552	£12,196,000	812,786	£14,219,570	988,039	£19,059,077[8]
Lead[3]	68,386	6,741,682	83,709	(5)	221,361[10]	14,521,845
Copper[3]	13,777	(4)	23,562	(5)	—	—
Zinc[3]	22,123	348,503	23,231	(5)	—	—
Manganese ore[3]	30,971	282,460	30,013	269,532	57,262	610,172
Lead vanadium[3]	969	(4)	7,663	478,286	4,050	335,610
Lithium ore[3]	7,288	58,418	4,255	85,123	5,645	63,906
Silver[7]	—	—	979,214	(5)	1,632,287	(5)
Tin conc[3]	371	130,872	372	136,000	449	180,457
Cadmium[3]	342	(6)	702	(5)	—	—
Beryl ore[3]	448	65,157	398	46,650	454	46,563
Germanium[3]	—	—	—	—	10	—

* Records of Government Mining Engineer. 1. Actual production. 2. Metric carats. 3. Short tons. 4. Value contained in lead. 5. Value contained in complex concentrate. 6. Value contained in zinc. 7. Troy ounces. 8. Estimated. 10. Total lead, zinc, copper concentrates.

Metal and Mineral Production and Value in Southern Rhodesia in 1954, 1955, and 1956

Commodity	*1954 Quantity*	*1954 £ Value*	*1955 Quantity*	*1955 £ Value*	*1956 Quantity*	*1956 £ Value*
Gold[1]	535,852	6,651,263	524,701	6,512,846	536,392	6,657,964
Gold premium[1]	—	35,743	—	69,300	—	66,735
Silver[1]	81,657	24,873	76,837	24,693	76,870	25,229
Diamonds[2]	2.0	30	—	—	—	—
Antimony ore[3]	117	4,295	370	6,860	114	10,904
Arsenic[3]	458	3,663	508	4,062	1,084	8,672
Asbestos[3]	79,961	5,922,724	105,261	7,051,831	118,973	8,524,671
Beryllium ore [3]	1,077	141,061	964	108,303	606	69,045
Chrome ore[3]	442,509	2,493,404	449,205	2,191,993	448,968	2,671,088
Columbite ore[3]	9.03	15,426	6.12	9,971	2.54	1,463
Copper[3]	297.8	38,388	1179	259,668	1,932	405,757
Corundum[3]	2,840	17,035	1,169	6,448	4,448	27,670
Fluorspar[3]	120	937	480	3,506	943	3,487
Iron ore[3]	70,885	13,291	92,835	17,469	127,954	23,930
Kynite[3]	40,753	48,904	23,820	28,685	31	1,897
Lead conc.[3]	1.84	74	27	1,196	646	31,446
Lithium						
Amblygonite conc.[3]	434	14,008	180	6,300	—	—
Eucryptite	12.32	86	—	—	—	—
Petalite ore[3]	26,707	131,796	24,210	120,828	13,524	67,620
Lepidolite ore[3]	26,909	136,216	57,714	201,063	84,599	302,396
Spodumene[3]	—	—	51	253	4,445	17,271
Magnesite[3]	77,915	38,879	11,610	32,237	8,611	12,917
Manganese ore[3]	18	9	1,330	665	816	408
Mica block[4]	184,897	53,776	141,616	36,387	123,214	35,650
Nickel ore[3]	62	921	18.20	427	200	8,398
Tantalum conc.[3]	7.15	11,208	2.23	3,414	14.66	21,708
Tin conc.[3]	22.74	9,455	336.6	144,071	566.9	262,370
Tungsten conc.[3]	259	166,201	226.27	144,738	264	168,133

1. Fine ounces. 2. Carats. 3. Short tons. 4. Pounds.

gram, including the installation of additional electrostatic separators and continuous grease-belt units. Industrial Diamonds expanded output at its new Saddle Hill North deposit. Sandwich Bay Diamonds Ltd. secured a diamond concession over about 700 square miles with a seaboard of about 24 miles near Sandwich Bay. A new company acquired a diamond concession covering one-half mile seawards from the high-water mark and extending 160 miles north from the Orange River mouth. Planned Investment Trust secured a diamond and base mineral concession over almost the whole Warmbad area, northwards from the Orange River. South West Africa Diamond Corporation Ltd. located diamonds in its Karasburg concession, extending northwards from the Orange River.

S. A. Minerals Corporation passed to the control of the Johannesburg Consolidated Investment group, which with Federale Mynboumaatskappy subscribed additional capital.

Lorelei Copper Mines L'd. estimated its ore reserves at 20,000,000 tons, and initiated output of copper and molybdenum concentrates. The milling plant is to be enlarged, as will the flotation plant for facilitating differential flotation of molybdenum concentrate.

SOUTHERN RHODESIA

The year 1956 was a record year for Southern Rhodesian mineral production, the value of which exceeded £23,000,000, an increase of nearly £3,000,000 over 1955. The major components of this increase were chrome, copper, lithium ores, tin, and asbestos, all mined from previously known deposits.

During the year a discovery of uranium was made in a Native Reserve near Umtali. It was still at the prospecting stage at year's end but noteworthy as the first occurrence of pitchblende recorded in the country.

Prospecting activity throughout the country continued to increase. The following companies (or their exploration subsidiaries) were actively engaged at the year end:—Anglo American Corporation of South Africa, Ltd., Rhodesian Selection Trust, Ltd., Rio Tinto Company, Ltd., Messina (Transvaal) Development Co., Ltd., Johannesburg Consolidated Investment Co., Ltd., Anglo Transvaal Consolidated Investment, Frobisher Limited, and New Consolidated Gold Fields Ltd. In most cases these companies examined prospects that were brought to their notice, though primary prospecting over extensive tracts of country was being carried out, and several new exclusive prospecting reservations were granted.

The Rio Tinto (Mineral Search of Africa) exploration at the Empress nickel strike at Ngondoma probably holds the most important potential for the country. A shaft, 12 by 7 foot, is being sunk to 1,000 foot depth in order to obtain representative ore for pilot plant experimental treatment. The Unniati River intermittently cuts communications to Ngondoma; plans include bridging this river and damming it for the 4,000,000 gallons per day estimated water requirements. Meanwhile a 1,200 yard airplane runway was constructed.

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Production and Export of Metals and Minerals in Tanganyika and Their Value in 1954, 1955, and 1956

Mineral	1954 Quantity	1954 Value	1955 Quantity	1955 Value	1956[1] Quantity	1956[1] Value
Diamonds[2]	329,912	£3,107,241	322,607	£3,199,437	357,982	£2,785,910
Gold (refined)[3]	71,447	891,807	68,892	864,279	59,293	741,582
Gypsum (raw)[4]	4,440	9,955	7,812	16,285	9,490	17,960
Kaolin[5]	260	2,483	46	507	10	105
Lead concentrates[5]	4,694	396,879	8,822	790,000	14,251	1,211,335
Lime[4]	870	4,139	955	4,471	782	3,476
Magnesite[4]	78	316	328	820	243	608
Meerschaum (crude)[4]	1.86	94[1]	4.50	227	5.79	290
Mica (sheet)[4]	78	74,503	65	68,083	57	58,728
Mica (waste)[4]	28	523	274	2,739	125	925
Salt[5]	6,866	68,828	9,498	90,207	9,359	92,613
Silver (refined)[3]	42,205	12,927	43,292	13,990	35,020	11,504
Tin concentrates[4]	54	27,330	55	29,114	20.98	11,741
Tungsten concentrates[4]	12	8,301	24	17,625	—	—
Uranium ore[4]	0.05	146	—	—	—	—
TOTAL: (Exports only)	—	£4,605,472	—	£5,097,924	—	£4,949,633

1. Estimated 2. Metric carats 3. Fine ounces 4. Long tons 5. Metric tons

Messrs. African Explosives and Chemical Industries (an I.C.I. subsidiary) purchased the Apatite bearing ring-complex at Dorowa during the year. This company is erecting a large fertilizer factory near Salisbury.

An important event was the purchase of the old Copper King and Copper Queen mines by the Messina Transvaal Company, who operate the Mangula and Umkondo properties. The mines were developed in the middle 1920's by S. R. Base Metals Corporation Ltd., but closed down in 1928, following a condemnatory report. An ex-employee repegged the mines five years ago, since when exploratory drilling has revealed a very large copper potential.

Chrome was found in the southern part of the Belingwe Reserve, 50 miles from the nearest previously known deposit. This is in a favorable position, relatively near the new railway line to Lourenco Marques. Monthly chrome railings at year's end were 40,000 tons via Beira, 5,000 via Lourenco Marques, and 5,000 via ports in the Union of South Africa, totalling 50,000 tons. There is a market for double this quantity and the reserves to meet this demand when adequate transport facilities exist.

TANGANYIKA

There was continuing steady progress in the mining industry in Tanganyika in 1956. Total value of mineral production was £5,450,000 which represented a slight decrease from 1955. Provisional export values show a figure of £4,949,633 and local consumption £423,189. Main reason for the decline in value was a fall in gold production. While diamond exports exceeded those of 1955, there was a decrease in their value. An increase in lead concentrate production, however, brought the total 1956 figure of mineral value close to those of previous years.

At Williamson Diamond Ltd.'s mine the new recovery plant with a capacity of 7,000 tons of gravel per day was completed and commenced operation. Despite the fact that this plant was not in full operation during the year, the amount of gravel treated rose to three times that in 1955.

At the Mpanda mine of Uruwira Minerals Ltd. lead concentrate production was 62 percent higher than 1955. A total of 14,251 tons of concentrates were shipped to Belgium for smelting.

Due to lack of ore reserves, the New Saza Mines Ltd.'s gold mine closed during the year which accounted for the 14 percent decrease in gold production values. The New Saza mine, which came into production in 1939, had milled more than 1,000,000 tons of ore to recover gold and silver worth nearly £3,000,000. In the Musoma district, the partners in the Kiabakari mine; Colonial Development Corporation and New Consolidated Goldfields Ltd., prepared for the installation of a treatment plant with a capacity of approximately 15,000 tons a month.

At the Panda Hill pyrochlore deposit preparations by the Mbeya Exploration Co. Ltd. towards the installation of a pilot plant to treat 150 to 200 tons a day were continued. Preliminary investigations indicated very large ore reserves.

A notable feature of 1956 was the greatly increased activity in large scale aerial prospecting. Government introduced a new scheme during the year granting exclusive short-term rights to aerial prospectors for which no charge was made unless results were shown. At one stage in the year nearly one-third (116,000 square miles) of the total area of the country was under temporary reservation for this purpose. The principal companies active in this field were Anglo-American Prospecting Co. (Africa) Ltd., New Consolidated Goldfields Ltd., and Williamson's Diamonds Ltd.

TUNISIA

Mining in Tunis in 1956 was highlighted by a record production of iron ore and a decline in phosphate output.

After the low rate of iron output in 1954 there was an upturn in 1955 which continued well into 1956. A total of 1,168,000 tons were mined in 1956 compared with 1,140,000 in 1955. The most important producer, by far, was the Société des Mines de Djerissa, followed by the Société des Mines de Douaria. Exports, as usual, went almost exclusively to Great Britain; the rest was divided among Germany, Austria, Holland, and Italy.

Lead production was divided among about 20 small mines. The Djebel Hallouf, Sidi Bou Aouane, Penarroya, and L'Asturienne des Mines remained the most important. The 1956 production of 39,000 tons showed a small decrease, compared with the 43,000 tons of 1955. The ore is treated in Tunis, and all the lead bullion was sent to France. An interesting discovery was made when again starting to prospect an old mine in the district of Gafour.

The zinc production also decreased, being 8,600 tons against 9,700 in 1955. The concentrate which is exported consists almost exclusively of zinc blende produced by the Cie. Equatoriale de Mines et Penarroya.

After an increase in 1955 to 2,200,000 tons, the production of the phosphate mines in Tunis once more decreased to 2,100,000 tons in 1956. France and Italy were still the best markets.

The Société Tunisienne de l'Hyperphosphate Reno exported about 115,000 tons of finely ground phosphate, the larger part to the southern hemisphere. Indochina and New Zealand bought the greatest quantity, followed by South Africa, Argentine, Thailand, Philippines, etc. For the first time, 10,000 tons were shipped to South Korea.

UGANDA

One major event marked 1956 as an important year in Uganda's mining history. This was the official opening in November, by the governor, Sir Andrew Cohen, of installations at Kilembe Mines, Limited, and the first blister copper shipments from Kilembe's smelter. Although the occurrence of copper in the Kilembe area of western Uganda has been known since about 1926, serious examination was begun by Frobisher Geologists in 1946. The present mine cost some £8,000,000 to bring into production and concentrates are railed to the smelter at Jinja which will ship, at full capacity, some 9,000 tons annually of blister copper.

During the year, the major Uganda tin mine, Mwirasandu, closed down. The mine which was operated by Kagera Mines Ltd. had been working since 1927 and had produced 5,716 tons of concentrate with a value of nearly £1,300,000. This represented over 50 percent of Uganda's total tin production during that period. Kagera Mines, a subsidiary of the Billiton Group, closed the mine due to lowering grades and loss of reserves.

The most valuable mineral export from Uganda in 1956 continued to be wolframite. 184 tons were shipped, showing an increase in value, at £128,000, or £16,000 over 1955 production figures. This was mainly due to increased mechanization, particularly at the Nyamulilo mine. Price per unit dropped from £13.6 to £11, but the British government continued to buy at a minimum contract price of £12.5 per unit.

Comparative Value of Mineral Production in Uganda in 1953, 1954, 1955, and 1956 Expressed in Thousands of Pounds (£)

Commodity	1953	1954	1955	1956
Gold	6	6	5	3
Lead (Conc.)	—	6	5	11
Salt	—	40	53	51
Wolfram Tungsten	165	147	112	128
Tin	65	58	49	18
Niobium Tantalum	15	24	15	4
Beryl	6	4	19	13
Apatite (Phosphate)	—	7	8	8
Total	257	292	266	277

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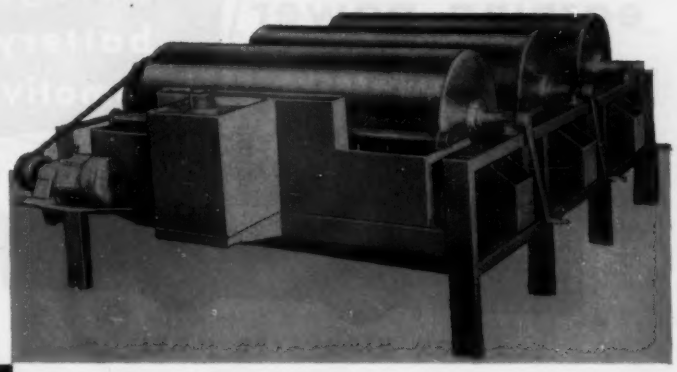

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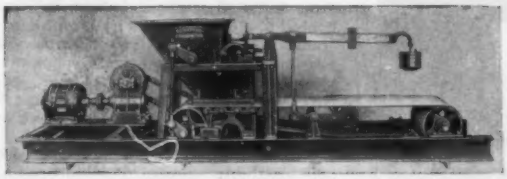

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14"	2' 6"	8 Tons		½" Cubes	No
	4' 6" & 6' 0"		24 Tons	½" Cubes	No
20"	2' 6"	15 Tons		1½" Cubes	No
	4' 6" & 6' 0"		60 Tons	1½" Cubes	Yes
30"	4' 6" & 6' 0"		158 Tons	3 " Cubes	Yes
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Africa

Unicorn Mines Ltd., under option agreement with the title holder, were exploring a lead prospect at Kitaka. Concentrates were produced from the development work and 121 tons were shipped during the year, an increase of nearly 50 tons.

UNION OF SOUTH AFRICA

During 1956, mining activity in South Africa reflected consolidation of the initial phase of uranium and/or gold production by the new mines in the Klerksdorp and Orange Free State fields and the unfolding of another phase of exploration and development. The Kinross area is now known not to be the last gold area which is to be found in South Africa. Other new exploration and development took place in 1956 for copper, manganese, chrome, tin, asbestos, and lead.

The gold and gold-uranium tax formula was reduced. A concession was approved in principle for future ultra-deep gold mining, with details still to be defined; concessions for purchasing new equipment were granted to other mines. The Atomic Energy Act security provisions were relaxed to permit publication of all data other than price and treatment costs. A research advisory committee was established to investigate the peaceful application of nuclear energy.

In the so-called Bethal area, further encouraging drilling results were obtained by the Union Corporation group and the well prospected area was defined as extending about 10 miles westwards and about 2½ miles eastwards from the Winkelhaak mine. The latter largely completed its initial shaft-sinking program, and is erecting its reduction plant which should be commissioned about mid-1958. In the Klerksdorp area, the Buffelsfontein mine initiated gold production and is expected to commission its uranium plant by about mid-1957. Vaal Reefs mine commissioned its gold and uranium plants.

In the Orange Free State, Free State Geduld commenced gold production, but opening up the high-grade southern section was retarded by the major east-west water-bearing fault zone just south of the two southerly shafts. The Merriespruit mine, after some months of production of gold and uranium-pyrite concentrates, was flooded by a water-inrush; baling operations were underway in 1957. The Harmony mine, which has erected and commissioned a pyrite recovery plant, is providing against increased water-inflow and flooding; this will retard the program of expansion. Total Free State milling is expected to rise to about 15,000,000 to 16,000,000 tons a year within the next few years, compared with about 9,400,000 tons in 1956. Underground water pumped to surface by the Free State mines has been at the rate of about 3.0 tons for every 1.0 ton of ore milled.

Exports of prescribed minerals, mainly U_3O_8, were valued at about £38,600,000 and are expected eventually to reach about £50,000,000 annually. The Hartebeestfontein, Loraine, Doornfontein, and West Driefontein commenced uranium production; the Welkom mine reported improved uranium values. The latter is likely to be included this year in the combined project embracing Presidents Brand and Steyn, Freddies Consolidated, Lo-

raine, Welkom, Western Holdings, and Free State Geduld; the last two of which are unlikely to initiate uranium production in the near future.

Rustenburg Platinum Mines was sinking a new shaft and erecting a new reduction plant with the total output capacity being raised to about 690,000 ounces a year of platinum group metals, on the 1955 grade. The joint refinery capacity is also being increased.

South African diamond output continued to sag, especially in gem stones. Sales contracts between The Diamond Corporation Ltd. and producers outside South and South West Africa were renewed to the end of 1960. De Beers Consolidated Mines reported no important new discoveries in South Africa, Bechuanaland, and Northern Rhodesia. The De Beers mines extended block-caving mining methods, and was effecting modernization of plant and processes in many directions, especially in the recovery of fine or small diamonds.

Manganese ore output in 1956 was again restricted by inadequate rail facilities and the accumulated stocks of the major producers. New deposits were acquired by the major companies—Associated Manganese and S. A. Manganese; some are being or are to be opened up; and exploration continued in the Kuruman-Hay-Postmasburg areas.

The Phosphate Development Corporation (FOSKOR) suspended phosphate concentrate output pending test results on conversion to superphosphate, and switched its flotation plant to producing copper concentrates. An extensive but relatively low grade copper deposit was located in and adjoining FOSKOR's property, over which deposit the Palabora Mining Co.—formed by Newmont Mining Corporation and Rio Tinto etc.—was granted a prospecting lease over the deposit.

Metal and Mineral Production for the Union of South Africa in 1952, 1953, 1954, 1955, and 1956*

Commodity	*1952 Production*	*1953 Production*	*1954 Production*	*1955 Production*	*1956 Production*	*1956 Sales Value*
Gold[2]	11,818,681	11,940,616	13,237,119	14,601,404	15,896,693	£198,499,603
Diamonds[2]	2,383,211	2,717,620	2,891,264	2,628,917	2,585,728	12,606,415
Silver[2]	1,176,433	1,193,152	1,320,060	1,461,336	1,582,045	521,679
Osmiridium[2]	6,141	6,966	6,482	7,094	6,586	131,507
Copper[1]	38,705	39,844	49,134	49,239	51,253	13,422,533
Tin[3 4]	1,591	2,400	2,827	2,147	2,887	439,126
Antimony conc.[1]	12,958	4,773	16,277	24,834	24,897	1,358,052
Beryl ore[1]	413	513	192	137	133	32,573
Bismuth ore[1]	3	1	1	0.16	580	——
Chrome ore[1]	639,370	798,567	503,955	597,372	690,855	2,979,783
Iron ore[1]	1,938,857	2,172,346	2,060,501	2,203,429	2,275,487	1,516,715
Lead ore[1]	866	706	230	758	1,340	55,413
Manganese ore[1]	964,127	912,339	594,517	649,475	768,400	4,138,433
Tungsten conc.[1]	271	421	573	646	304	752,239
Andalusite[1]	21,477	11,772	14,152	19,359	30,244	276,334
Asbestos[1]	133,839	94,817	102,455	119,698	136,521	7,674,389
Barite[1]	1,894	2,092	2,058	1,892	2,713	10,444
Corundum[1]	4,179	1,865	1,443	834	2,068	35,828
Fluorspar[1]	11,343	16,029	14,262	32,839	35,065	204,438
Graphite[1]	389	413	1,164	1,829	1,862	6,176
Kaolin[1]	8,244	8,719	13,474	11,275	11,621	31,173
Magnesite[1]	26,906	25,229	22,479	19,753	33,485	68,104
Mica[1]	2,941	2,147	4,556	3,914	2,520	20,018
Talc[1]	9,562	7,974	7,413	1,581	1,968	11,140
Vermiculite[1]	39,918	33,844	44,006	47,904	58,717	368,857
Platinum group metals[2]	——	299,117	270,885	381,732	484,574	8,123,980
Lithium ore[1]	——	60	57	426	713	12,675
Pyrite[1]	——	103,446	236,513	398,849	481,560	1,344,675
Uranium and Thorium	——	——	——	——	——	38,571,695

* Records of the Government Mining Engineer. 1. Short tons. 2. Fine ounces. 3. Metric carats. 4. Metal and concentrate.

Asbestos operations generally reflected improvements in tonnages milled, quantity and/or quality of fiber extracted. Associated Ore sold accumulated crocidolite stocks and was stepping up output. Msauli Asbestos increased and improved fiber output, and was equipped for both open-pit and underground operations.

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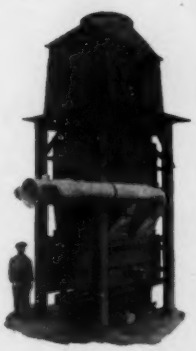

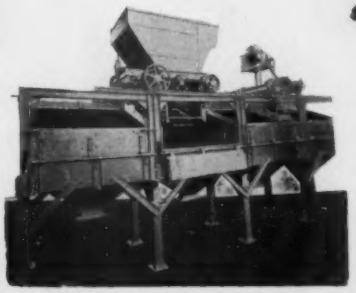

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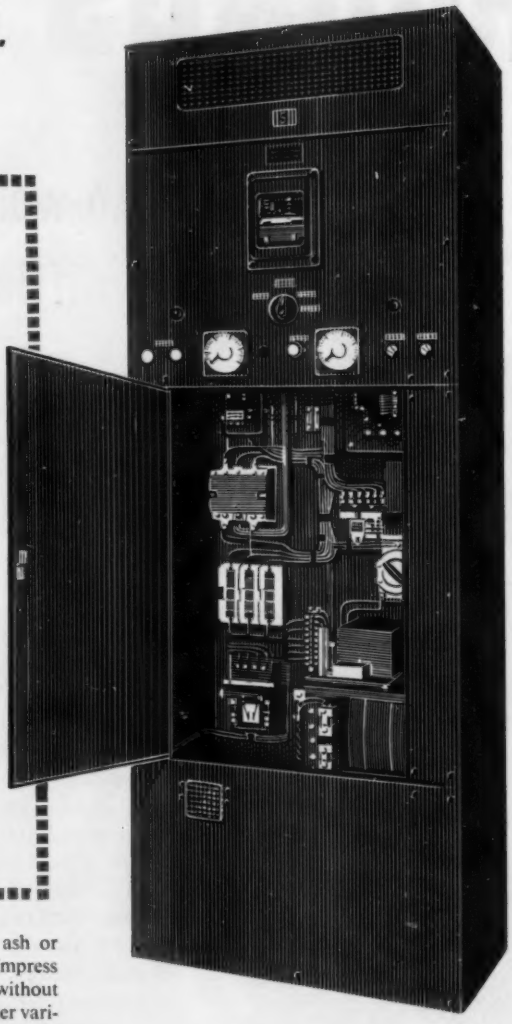

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CARIBBEAN

BRITISH VIRGIN ISLANDS

A group of about 28 islands and cays, of which six, especially Tortola, Anegada, and Virgin Gorda are inhabited, that form a geographic unit with the Virgin Islands of the United States. The mineral industry is limited to the production of salt, sand, and a little stone. Solar evaporation of sea water on Salt Island and Anegada furnishes crude salt for local use and export to the other islands of the British West Indies. Beach sand is produced primarily for export in small sailing vessels, largely to St. Thomas in the U. S. Virgin Islands. Copper mineralization is known from many of the islands and high-grade copper ore was shipped from Coppermine Point, Virgin Gorda, during the early and middle 19th Century. During World War I the dump of this mine was picked over and 3,000 pounds of molybdenite recovered and shipped out. The dump still contains significant quantities of copper and molybdenum. A concession has recently been granted to a Jamaican mining company and exploration of the deposit is being carried out.

CUBA

The mining industry in 1956 continued its rapid rate of expansion which within a few years has raised it to fourth place among Cuban industries—and is fast overtaking tobacco for third place (after sugar and tourism). Mineral exports, which totaled only about $12,000,000 in 1951, were estimated to be valued at approximately $35,000,000 during 1956.

During 1956 exploration continued throughout the island, and between $7,000,000 and $10,000,000 was committed to various expansion programs. In Oriente Province, in particular, there was a "boom" feeling. This was due in part to extensive exploration, and in part to the $40,000,000 nickel and cobalt construction program launched by the Freeport Sulphur Company at Moa Bay. The company applied to the Cuban government for tax exemptions granted to "new industries."

The copper market in the United States spurred Cuban production. Exports jumped during the first six months of 1956 to 33,845 tons, worth $6,823,706, compared to 29,405 tons, worth $5,137,846, during the same period of 1955.

During the first six months of 1955 and 1956, iron exports jumped from 39,732 tons to 66,377, nickel from 6,896 to 10,355 and manganese from 95,615 to 131,353 tons. Chrome exports, however, declined from 20,980 tons to 9,985.

Despite the favorable copper market, the Francisco mine had to close down due to labor difficulties. The mine, in Pinar del Rio Province, represents an investment of $1,500,000, and during the closure a $100,000 expansion program is being prepared. Additional ore reserves are being blocked out. The mine normally produced 1,000 tons of concentrate monthly.

Uranium-seeking continued Island-wide during 1956, although no commercial finds were announced. The Inter-American Uranium Corporation was formed, with Cuban and United States capital, to explore for the ore, and it secured mineral rights to 1,200 hectares of land in Pinar del Rio.

The government issued Law-Decree 2462 to regulate and spur the development of gold production. Included among the terms of the law was a provision that gold could only be sold to the Banco Nacional de Cuba.

HAITI

Bauxite mining started in Haiti in 1956.

The first mining operations of any importance in Haiti's history started in 1956. This was the mining of bauxite; preparations for which started in 1955. All mining preparations and actual mining were done by a new wholly-owned subsidiary of Reynolds Metals Company known as Reynolds Haitian Mines, Inc. which took over all Haiti operations on January 1, 1956.

Construction continued throughout the year on the drying plant, loading-out facilities, dry ore storage, shops, laboratories, administration building, power plant, etc. Completion of all construction is scheduled for March 6th, 1957.

Actual mining operations commenced on July 18th, 1956 with Marion 111-M shovels and Caterpillar tractors and scrapers. Bauxite is transported in Dart 30 cubic yard Diesel trucks with heated bodies over a four lane paved highway from an altitude at the mining area of approximately 3,000 feet to the wet ore stockpile at sea level.

Drying of Bauxite will be initiated in March, 1957, and the first shipload will be loaded out in April, 1957, for transportation to the La Quinta plant of Reynolds Metals Company near Corpus Christi, Texas.

Flexibility was the keynote of all design. With only a few hours' notice production of dried bauxite can be increased from the "normal" rate of 400,000 long dry tons per year to 1,200,000 long dry tons.

Canadian firms—Haitian Copper Corporation, and Haitian-American Minerals—diamond drilled for copper during the year. Haitian-American found a flat deposit which could be open pitted if tonnage and grade warrant. Geophysical surveys of its concession continued.

JAMAICA

The total Jamaican bauxite production in 1956 amounted to about 3,500,000 tons. Of this amount, 2,978,540 tons were exported to aluminium producers in the United States in the form of kiln-dried ore with an average moisture content of 13.5 percent. This corresponds to 2,574,673 tons on theoretically dry basis, on which a royalty is paid at the rate of one shilling per ton. About 600,000 tons of bauxite were consumed by the local alumina plant (Kirkvine Works, Alumina Jamaica Ltd.), to produce alumina, of which 213,320.9 tons, were shipped to aluminium smelter in British Columbia.

During the year the three operating bauxite companies increased their production and announced plans for further expansion of bauxite exports as well as alumina production. Construction work for extension was in progress at Kirkvine Works, in Manchester, to increase the capacity of the plant from the present 210,000 tons to about 500,000 tons per annum. The expansion of the plant is scheduled to be completed by mid-1957. Alumina Jamaica Ltd. also announced plans for the erection of another alumina plant at Pleasant Farm, near Ewarton, St. Catherine, with an initial capacity of 220,000 tons, at an estimated cost of some £12,000,000.

Kaiser Bauxite Company also embarked on expansion programs involving an additional investment of £10,000,000 and are planning to construct another ore-drying plant, storage, and port facilities at Discovery Bay, in order to develop the bauxite deposits of western St. Ann and Trelawny. Reynolds Jamaica Mines Ltd. began a program for doubling production by extending present facilities at Belmont, St. Ann. It is estimated that by 1958 the total bauxite output will be in the region of 6,000,000 tons per annum or about double the present production.

Jamaica Gypsum Ltd. continued mining operations on gypsum, operating a quarry and a crushing plant at Brooks in the Bull Bay area, and a loading pier at Harbour Head. The bulk of crushed gypsum rock is exported to the United States and only a few thousand tons are sold locally to the Caribbean Cement Co. Ltd., and local producers of plasterboard. In 1955 a new crushing plant was established at the quarries and mining and hauling facilities improved. While, during this reconstruction work the production dropped to about 82,155 tons, it rose again when the work was completed, and last year's gypsum output amounted to 124,876 tons.

Intensive prospecting work was in progress throughout the year for iron and base metals. An airborne magnetometer survey covering an area of 612 square miles was carried out by Jamaica Copper & Iron Ltd., and several magnetic anomalies were located which are being investigated on the ground. Increased attention was also given to the copper occurrences in upper St. Catherine, Clarendon, and elsewhere where copper minerals occur in veins in andesitic and granodiorite rocks. Small-scale mining operations were carried out on these deposits some hundred years ago and a number of these small early mines were opened and re-examined, and several companies applied for exclusive prospecting rights for the more promising areas where drilling and geochemical prospecting is in progress. Prospecting work was also continued on the lead and zinc deposits of the old Hope mine in St. Andrew.

At the end of 1956 there were in all 30 Prospecting Rights current of which three were endorsed to include radioactive minerals. There were 22 Exclusive Prospecting Licenses in operation in respect of various minerals, covering areas amounting to over 1,000 square miles.

PUERTO RICO

Industrial minerals have for several years predominated in the mineral production of Puerto Rico, but interest in

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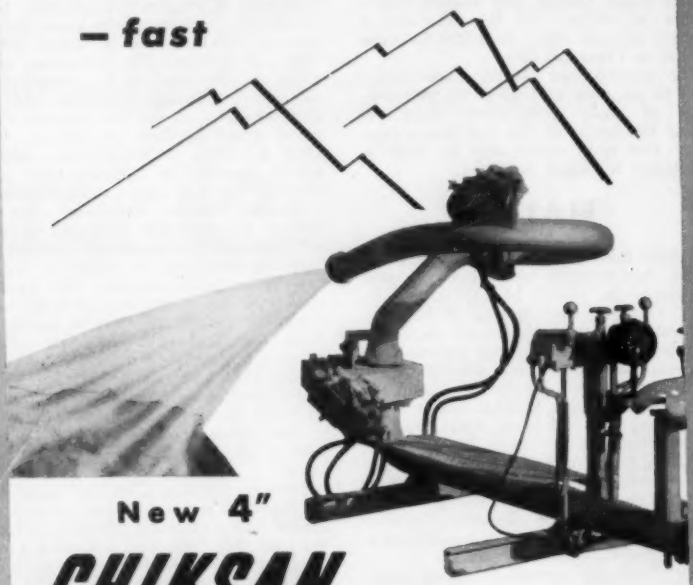

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Caribbean

deposits of metals has shown a decided upturn during 1956. The total value of all minerals produced in Puerto Rico in 1954 was $13,496,567. In 1955 there was an increase of more than 10 percent to $14,789,526, and preliminary production figures for 1956 are expected to show a similar increase corresponding to the continuing increase in construction.

The two cement plants, with a production of over 4,000,000 barrels in 1955, consumed the major part of the clay and limestone quarried in the Island. In addition, a small amount of high-grade magnetite is quarried each year for use as a raw material in cement manufacture. Limestone is also quarried in many parts of the Island for concrete aggregate, agricultural soil conditioner, and for the production of 10,400 tons of lime for use in sugar refining.

As in 1955 the only production of metals in 1956 was a little placer gold and platinum panned mainly by farmers in the mountains during spare time. Previous estimates of 10 ounces of precious metal production per year are probably low and the total may be closer to 60 ounces. However, because of the number of prospectors involved and the informality of disposal, no reliable figures are possible. Two exclusive prospecting permits and one lease were issued in 1956 for precious metals by the government for the first time in several years. They cover parts of the Naranjito-Corozal area which is noted as the source of most of the 16th Century gold shipped out of Puerto Rico by the Spanish.

Intensive geophysical prospecting was initiated late in 1956 in three known mineralized areas for copper, iron, lead, and associated metals by one company. Other exclusive prospecting permits have been issued for dolomite, dolmitic limestone, and petroleum. Geological and engineering investigations completed or current during 1956 by the Puerto Rico Mineralogy and Geology Section and the cooperative parties of the United States Geological Survey and the U. S. Bureau of Mines included studies of the Juncos magnetite deposit, magnetite-bearing beach sands near Ponce and Barceloneta, nickel-cobalt-bearing laterite at Guanajibo near Mayagüez, lead-silver at Carmen, copper at Comerío, dolomite near Cabo Rojo, and cave phosphate on Mona Island.

VIRGIN ISLANDS OF THE UNITED STATES

This group of about 50 islands and cays, of which only a few, particularly St. Thomas, St. Croix, and St. John are inhabited, form a unit with the British Virgin Islands. About 10,000 tons a year of crushed stone and a little sand are the only products of the mineral industries of the Territory.

A number of copper showings are known but have not been worked. Several claims were filed recently for copper on St. John but the validity of these claims is in question because of the creation of a National Park over much of the area of St. John.

LATIN AMERICA

ARGENTINA

Mining activities in Argentina experienced a healthy upsurge during 1956, in keeping with the new climate that has ruled the country since the overthrow of the Peron government. The present provisional government supports the principle of "free enterprise" and, in keeping with this, permits free export of minerals by the mining concerns.

The federal government promoted the following activities during the year:

1. Installation of several milling facilities; among them, one for lead in San Juan and another for aluminum compounds in Calingasta.
2. Investigation of possibility of reopening El Trapiche copper mine in San Luis.
3. Prospecting of 47 wolframite deposits in San Luis.
4. Studies of the gold districts, including Marayes in San Juan, Farellon Negro and Inchausti in Catamarca, El Oro and Magote Rio Blanco in La Rioja, Andacollo in Neuquen, and La Carolina in San Luis.
5. Installation of a modern laboratory in San Juan for mining research.
6. Extensive survey of triplite deposits of Cancara in San Luis to determine whether they can be used in the manufacture of phosphate fertilizers.
7. Start of construction of a steel plant to be operated by Sociedad Mixta Siderurgica Argentina which will produce 588,000 tons of steel annually.
8. Increase in uranium mining. There are 12 mines in active development and 150 radioactive ore deposits being explored. (Some development work is also being done privately.) All activities are centralized by the National Committee of Atomic Energy which is now equipped with the most modern atomic science instruments.

During the year in review, private mining companies accomplished the following:

1. Manganese mining was on the increase, with an average monthly rate of 2,000 tons.
2. The $1,250,000 Minarbipa plant for production of molybdenite and manganese concentrates was near completion in San Juan.
3. United States interest in tantalite increased prospecting for this mineral.
4. Reopening of the King Tud cobalt mine in La Rioja, Argentina's most important cobalt deposit, was planned.
5. $30,000,000 was invested in erection of a plant in Mendoza to produce iron-manganese (Fe-Mn) and iron-silica (Fe-Si) at the rate of 500,000 tons annually.
6. Installation of milling facilities to treat 1,000 tons of ground fluorite and 300 tons of ground and floated fluorite (average grade 97-98 percent) was underway in Cerros Negros, Cordoba.
7. A private firm sponsored copper and gold development at Cerro Huachi in San Juan.
8. Great interest was shown in borax deposits in Puca de Atacama and several mining firms prepared for development work in this area.

BOLIVIA

During 1956 the downward trend of Bolivian mineral exports continued. However, due to higher prices the total dollar value was up slightly to $101,115,380. As customary tin was by far the most important metal and was followed, in order, by tungsten, lead, silver, zinc, copper, antimony, gold, and bismuth.

Reliable production figures are not available. Exports do not always reflect true mine production. However tin production of the Corporation Minera (nationalized mines) was reported to be down only 500 tons. The medium and small mines continued to operate under extremely difficult conditions.

Tungsten producers found themselves in a difficult position at year's end due to price declines. During the year several contracts for small mine output ended from $59.00 per short ton unit to the much lower world price. At year's end the Banco Minero contract was ended. This contract covered about 50 percent of total output.

The United States consulting firm of Ford, Bacon and Davis completed its long study of the mining industry and issued an impressive nine volume report. At year's end none of the many recommendations to improve the mining economy had been put into force.

Negotiations continued between the government and the National Lead Company for the granting of a concession to mine the large and important Matilde zinc-lead-silver deposit.

The most important development of the year was the proposal by a new firm —Bolivex Corporation—to carry out a large exploration program with photogeological and geophysical surveys over a large part of Bolivia. The new firm was formed jointly by Ventures Ltd. of Canada and Vitro Minerals Corporation of the United States. The new firm negotiated with Dr. Herman Siles Zuazo, Bolivian president.

Production of Metals and Minerals In Bolivia in 1954 and 1955 and Exports in 1956

Commodity	*1954*	*1955*	*1956*
Tin[1]	29,186	28,470	27,273
Tungsten[2]	2,451	2,437	2,860
Antimony	2,457	5,288	5,112
Lead	18,438	21,394	21,571
Silver	—	—	234
Zinc	15,305	18,515	17,071
Gold	890[3]	980[3]	750,157[4]
Copper	3,589	3,518	4,443
Bismuth	—	—	34

1. Tin exports in 1953 were 35,394 metric tons.
2. Includes both wolframite and some scheelite.
3. Kilograms. 4. Grams.

BRAZIL

The Brazilian mineral production is becoming larger and larger every year. If 1956 was particularly important for the country, 1957 will be of considerable importance. There is no doubt that a general optimism seems to pervade the mining interests. Many factors entered into the progress of the mining industry: the main railway for the transportation of iron ore (Vitoria-Minas) has been considerably improved; many mines were mechanized with electrical units, compressors, drills and other machinery, and are ready for speed production. The present government is busy creating a better climate for the promotion of a sound mining industry. There is a favorable climate for foreign firms and foreign capital provided that they contribute to the economical development of the country.

The principal mining events in 1956 and forecasts for 1957 are the following:

The Brazilian firm, "Indústria e Comércio de Minérios" (ICOMI), and Bethlehem Steel Company which own the concession to explore the substantial manganese ore deposits in the Territory of Amapá, started to export. During the first six years, to start in 1957, ICOMI will export 1,000,000 tons of manganese ore. After this period the exports will be 500,000 tons annually, according to the contract. The value of these exports will be $56,000,000. After that manganese ore will be classified as the second source of dollars, the first being coffee. The harbor of embarkation, built in two years, has the capacity to load ships of 36,000 tons in 10 hours.

The Brazilian exports of iron ore were, in 1956, the largest in history. In the first quarter of 1956 the exports reached 1,376,454 tons, almost twice of what was registered in 1954, for the same period. The 1956 first quarter production was almost the same as the whole year of 1953, i.e., 1,526,495 tons. According to president Sá Lessa of "Companhia Vale do Rio Doce," this company has signed contracts in Europe, and United States, to sell 2,400,000 tons of hematite to be shipped in 1957. The average price is $14.50 per ton.

A second large deposit of pyrochlore was discovered, in 1956, in the place named Sacramento, Minas Gerais State. The reserves are estimated in 100,000,000 tons. The Columbite content of this new ore is reported above 3 percent while the African ore reaches 0.3 percent.

An important event occurred in late 1956 when the Saint John Del Rey Mining Company shares were sold to United States men. The gold mine which has been operated by English capital since 1834, located in Morro Velho, Nova Lima, state of Minas Gerais, has already reached the depth of 3,000 meters. Five thousand workers are employed in the mine, 3,200 of them working below the surface. Important high grade iron ore deposits and also bauxite is reported to exist on lands controlled by St. John Del Rey. Manganese deposits have also been reported on the 130 square mile mine property. The united States group believed to be in control is headed by H. Thomas Osborne of the firm of Osborne and Thurlow.

Aluminum production was about 10,000 tons from the one plant near Sao Paulo. Bauxite ore is mined at Pocos de Caladas in Minas Gerais state. Lead mining expanded in the state of Parana.

There appears to be no question but that the zinc-copper deposit near the

small village of Vazante in northwestern Minas Gerais represents one of the world's major zinc ore bodies. Only a limited amount of development was done at the property during the year.

BRITISH GUIANA

The mineral production of British Guiana is limited at present to bauxite, gold, and diamonds, but within the next two years should include manganese, and columbite.

There are two major mining concerns exporting bauxite: Demerara Bauxite Company Ltd. (a subsidiary of the Aluminum Company of Canada) and Reynolds Metals Company, which have made British Guiana one of the largest producers of bauxite in the world. Demerara Bauxite is also working the Crown Leases held by Plantation Bauxite Company Ltd. under agreement between the companies.

A comparison of bauxite production in long tons for the years 1956 and 1955 is given below:

	1956	*1955*
Demerara Bauxite Company Ltd.	2,227,670	2,187,175
Reynolds Metals Company	244,526	212,847
Plantation Bauxite Company Ltd	8,770	35,260

The high grade bauxite found in British Guiana is specially adaptable to processing for the refractory and abrasive grades after calcining, and Demerara Bauxite have established the world's largest bauxite treatment plant at Mackenzie with an annual capacity of 1,700,000 tons of dried bauxite and 300,000 tons of calcined bauxite. The company has decided to establish a plant for converting bauxite to alumina.

Gold production for 1956 amounted to 15,815 bullion ounces which represents a decrease of nearly 8,000 ounces from the 1955 production total. Some 80 percent of the total gold produced comes from gold dredging operations by British Guiana Consolidated Goldfields Ltd. The company has been restricted to one-dredge operation for nearly two years due to the shut down of the Mahdia dredge and the delay in generating power for the Konawaruk dredge from the Tumatumari Falls hydroelectric station.

A modern dredge was brought to British Guiana from New Guinea and assembled on the Konawaruk River after it was flown from Georgetown piece-by-piece in a hired Dakota aircraft. Completion of this dredge is dependent on the putting into commission of a hydroelectric plant at Tumatumari. Unseasonable rains delayed this project but it is now estimated that hydroelectric power will be available towards the end of the third quarter, 1957, and this should make it possible for the Konawaruck dredge to start towards the end of 1957.

Diamond production has so far depended solely on the efforts of thousands of small workers using hand methods but the limited placer deposits are being rapidly worked out and these methods are being replaced by deep diving and the use of suction equipment on alluvial deposits in river beds. Production for 1956 was 29,816 metric carats as against 33,300 metric carats for 1955, a decrease of nearly 4,000 carats. Small scale activity was hampered for the greater part of the year by the water logged condition of the river flats due to heavy rain, while diving was restricted to the shallow stretches in the upper reaches of small rivers like the Karanang which have a rapid run off from the Mazaruni escarpment.

In the North West District manganese ore has been proved in sufficient quantities to warrant mining and it is expected that within the next two years actual exports will commence. A railroad location survey over a distance of 40 miles to connect mine with port has been completed and construction work on mine buildings at Matthews Ridge is in progress.

A new development, which if successful, may greatly influence mineral production, not only in British Guiana but elsewhere, took place in the Colony as the Canadian controlled British Guiana Exploration Co. Ltd., is considering diamond mining by a new method of underground and/or underwater mining, invented and patented by Messrs. C. P. T. Aston and K. Wildi. This apparatus sinks its own shaft to the deposits by vertical water jets under pressure. When the wash is reached, horizontal jets replace the vertical ones and break down the alluvial deposit over a pre-determined area which is then lifted by gravel pumps to a treatment plant at the surface. This process

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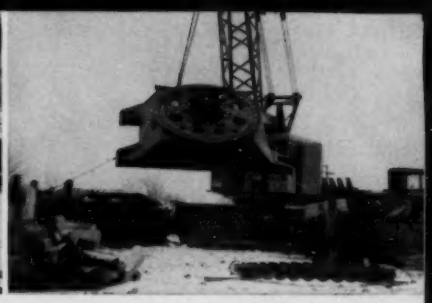

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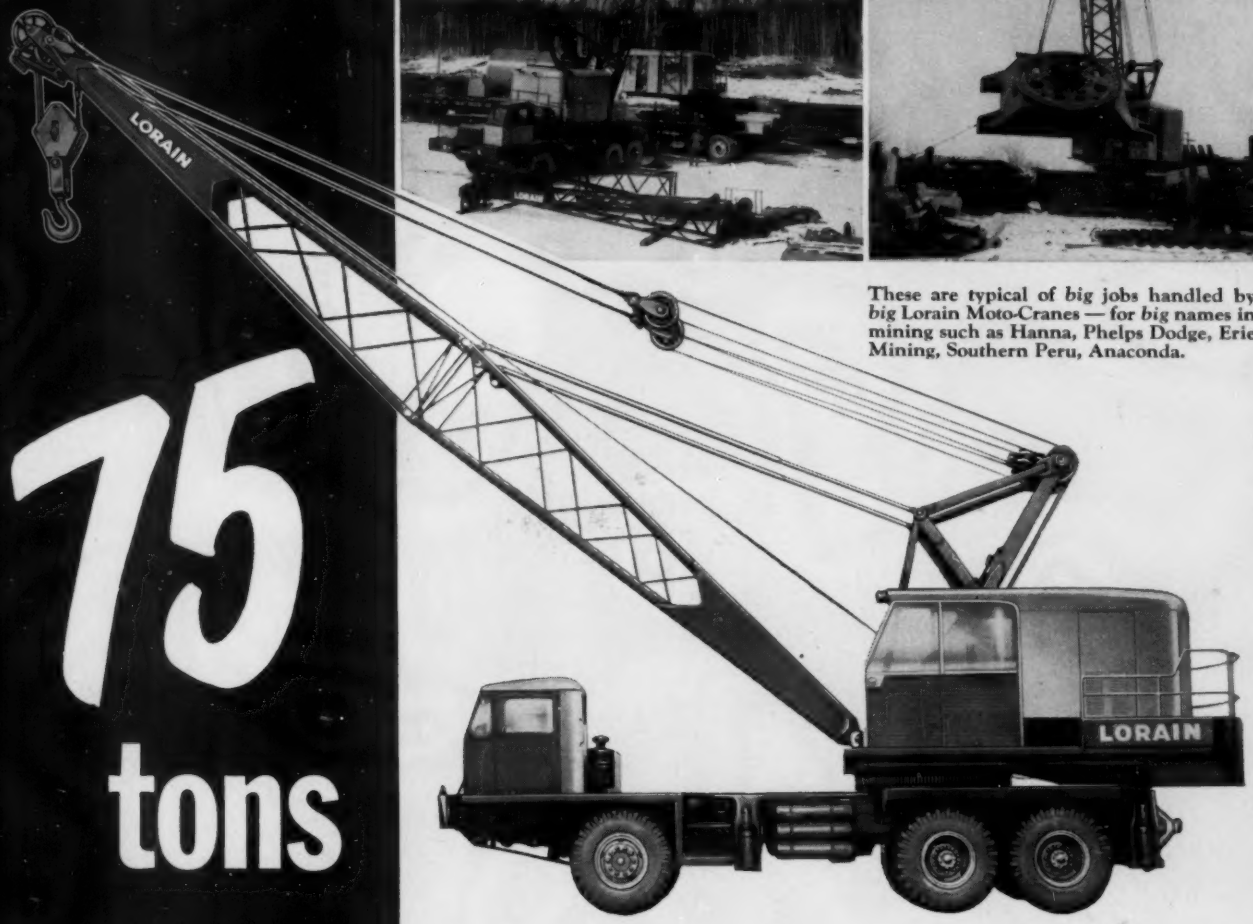

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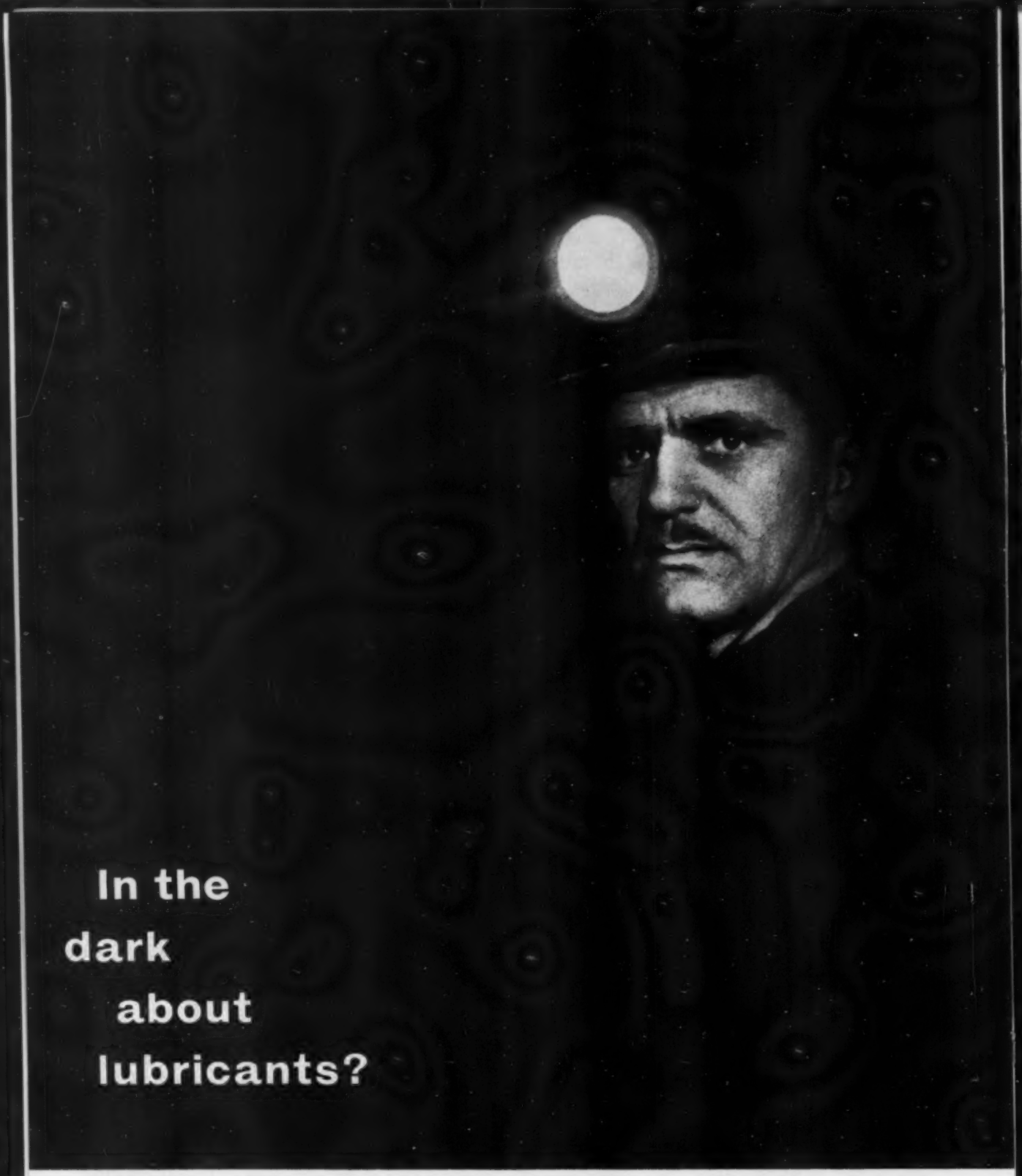

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was originally tried in Nigeria and its underwater application is successfully carried out in Switzerland for the recovery of deep-lying lake gravel.

CHILE

Generally speaking, mining in Chile increased throughout 1956. Chiefly because of currency stabilization, the passage of legislation stimulating new investments and increased capitalization of existing companies, the absence of long drawn-out labor conflicts among the larger producers in all but the nitrate industries, constant world market demand for the production of the Chilean mines, and the generally favorable world market prices for metals throughout the year. Great strides were made during 1956 in controlling inflation by the Chilean government. Limiting the increase in wages, salaries and prices of essential commodities played an important part as has the creation of a free exchange whereby the official rate has been eliminated and the dollar has been allowed to fluctuate in value depending on the demand that exists.

Quite obviously costs in Chile dropped for United States mining interests who at the end of 1956 were getting above 500 pesos for their dollars where formerly they were receiving much less. Chilean economy is more and more dependent on the copper industry as is evidenced by the fact that copper exports are responsible for 58 percent of Chile's foreign trade. The copper industry in addition pays more than one third of all the Chilean government's expenditures and employs more than 200,000 people.

At the Chile Exploration Company's Chuquicamata mine production was stepped up from 90,000 tons of ore per day to better than 110,000. This was achieved through the installation of larger capacity shovels and the acquisition of new locomotives which are capable of hauling greater loads from the mine to the mill. Chile Exploration will probably install the necessary facilities for the recovery of the molybdenite which occurs in small percentages in its ore.

Andes Copper Mining Company at Potrerillos continues to produce some 24,000 tons of ore per day in order to keep the mill working at capacity. Ore reserves are dropping and the mine is not expected to operate for more than two or three years at a maximum. In view of this, the Anaconda Company speeded the exploration and development of the El Salvador mine where there now is a proven ore body consisting of some 200,000,000 tons of 1.6 percent copper ore. Plans call for the construction of a complete camp and mill at the mine with concentrates being smelted at the Potrerillos smelter. In time, this phase of the operation will probably be carried on at a new smelter site, possibly near Chañaral.

Braden Copper Company had a good year due to ample water supplies and the fact that recoveries were improved. The tonnage from the mine dropped to around 28,000 tons per day during the winter months when demands on the electric supply were high for lighting, cooking, and heating purposes but tonnage picked up again as the days lengthened and in October, November, and December the tonnage mined per day was in the neighborhood of 34,000. There is a provision at the Caletones smelter for stockpiling any and all concentrate which cannot be treated by the reverberatory furnace thus having concentrate available for smelting during the winter months when concentrator production drops due to either a lack of water or electrical power.

The medium and small copper producers finished a record year registering a production increase of 12 percent over 1955. Production figures for 1956 were 305,449 metric tons as against 272,783 metric tons in 1955. Cie. Miniere du M'Zaita, Cia. Minera Disputada de Las Condes, Cia. Minera y Comercial Sali Hochschild, Cia. Minera Merceditas, and Callejas & Cia. account for a large proportion of the production of these producers.

New developments during the year among copper producers include the start of operations at the Astilla mine by Sociedad Minera Santa Margarita de Astilla and the Morado mine by the Sociedad Minera Santo Domingo del Morado. Both ventures being undertaken by Callejas & Cia. Cia. Minera Tamaya opened a plant to treat ore from the Quiroga mine which lies close to Ovalle. The Santiago Mining Company, an Anaconda subsidiary, will have its Africana mine in production in 1957. Cia. Minera del Plomo and Cia. Minera Tamaya both have prospects in the general Chile Chico area of Lago Buenos Aires which they hope will be in production in 1957.

The future for the small producer looks promising especially if he can keep his costs down and his grade up. It is the intention of the Chilean government that as much work as possible be done in Chile so as to realize more dollars from the final product shipped. As a result the Paipote smelter was operated steadily and the Chilean government has made studies for a new smelter site. It is probable that the new smelter will be erected in the Calera area.

Iron ore production in Chile increased during 1956 due to the efforts of the smaller producers who have increased greatly in number as well as in size. Bethlehem Steel Corporation's production was slightly under that of the previous year. Bethlehem is opening up the Romeral mine which started producing in April and continued purchasing ore at El Tofo from the various small miners in the area. The iron ore shipped by Bethlehem Chile Iron Mine Company to the United States and to the Cia. de Acero del Pacifico S.A. steel mill at Talcahuano totalled 484,543 tons from Romeral in 1956. El Tofo output was 679,168 in 1956 and 1,234,280 in 1955.

Among other producers the largest was Cia. Minera Santa Fé which operates near Ovalle, Incahuasi, and Chañaral. In addition the firm buys iron ore in these zones as well as in the Copiapo, Vallenar, Coquimbo, and Ovalle areas. This company plans to mechanize the port of Chañaral so as to speed up shipments from there.

Production in the nitrate industry of Chile fell some 250,000 metric tons short of its normal 1,600,000 annual figure. This difference was due to a prolonged strike at the María Elena and Pedro de Valdivia "Oficinas." The nitrate producers were aided during the year with the passage of the Nitrate Referendum which gives them certain privileges with regard to duties on imports, this lowering the cost of large scale improvements requiring new machinery which must be brought in from outside the country.

COLOMBIA

South American Gold and Platinum Company, which already controls about two-thirds of Colombia's gold production, added to its holdings during the year by acquiring more than 30 percent of the stock of Frontino Gold Mines Ltd. (In 1955, South American Gold had purchased 35 percent of Pato Consolidated Gold Dredging Ltd.) Frontino holds mining rights over 12 square miles and surface rights over about 40 square miles in the Province of Antioquia.

Pato Consolidated Gold Dredging, Ltd. dredged 27,553,000 cubic yards in 1956 to recover 197,840 ounces of fine gold. In 1955, the firm had dredged 26,836,000 cubic yards to recover 160,-891 ounces. Net profit for 1956 totaled $2,750,000, compared with $2,033,600 in the previous year.

Asnazu Gold Dredging Ltd.'s dredge ceased operation on November 26, 1956, bringing the company's operations in Colombia to an end. It is expected that the firm will go into liquidation, with assets distributed to the stockholders in 1957. For the year ended December 31, 1956 the company had dredged 1,176,-520 cubic yards to recover 13,946 ounces of fine gold. In the previous year the firm had dredged 1,246,240 cubic yards to recover 12,240 ounces.

Copper Production in Chile by the Anaconda Company and Kennecott Copper Corporation Mines In Pounds By Months in 1955 and 1956, and Total Production For 1953, 1954, 1955 and 1956

	ANACONDA				KENNECOTT	
	CHUQUICAMATA		POTRERILLOS		BRADEN	
Month	*1955*	*1956*	*1955*	*1956*	*1955*	*1956*
Jan.	42,424,960	36,154,334	8,751,463	4,272,288	26,415,000	20,522,000
Feb.	43,025,740	41,213,416	8,061,676	7,222,382	25,968,000	26,404,000
Mar.	41,673,132	45,066,294	8,193,242	6,606,570	26,623,000	27,242,000
April	40,123,561	45,052,226	7,896,386	6,831,358	28,772,000	27,578,000
May	39,871,551	44,863,818	7,507,923	6,642,604	29,852,000	28,404,000
June	44,111,119	39,737,599	7,055,662	6,877,249	24,965,000	27,012,000
July	37,793,856	42,873,873	7,436,236	7,591,934	24,735,000	31,296,000
Aug.	41,468,857	50,009,022	8,028,416	7,729,404	24,209,000	30,668,000
Sept.	30,820,769	43,132,678	7,305,617	6,851,008	23,523,000	32,968,000
Oct.	38,886,316	50,203,691	3,739,813	9,515,446	27,377,000	34,980,000
Nov.	41,577,695	47,033,152	7,462,531	8,283,514	32,003,000	37,502,000
Dec.	19,704,671	46,668,240	3,260,914	7,906,416	15,500,000	35,250,000
Totals	461,482,227	532,008,343	84,699,879	86,330,173	309,942,000	347,826,000
Total 1954[1]	236,100[2]					98,552
Total 1953[1]	199,469[2]					128,215

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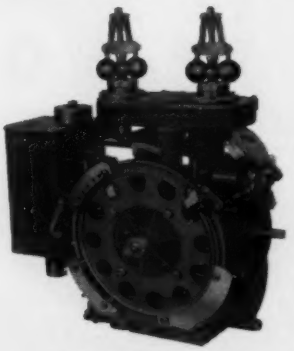

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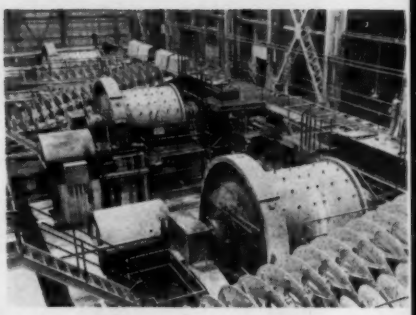

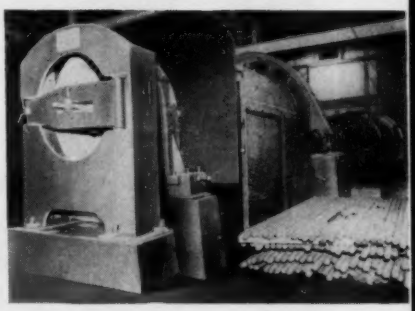

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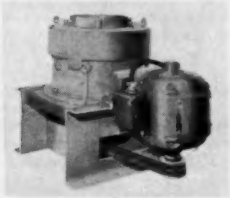

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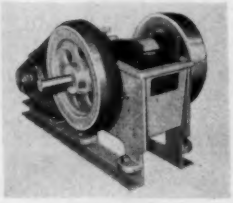

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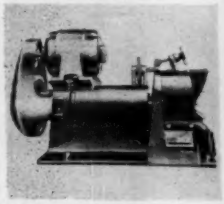

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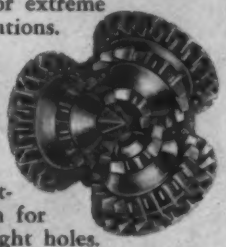

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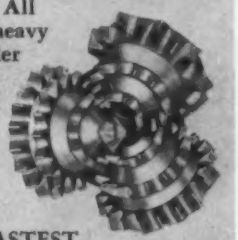

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Latin America

MEXICO

Mexico's largest increase in metal production in 1956 was in the output of manganese ore. Total production of manganese ore in 1956 was 487,608 metric tons, compared with only 37,078 in 1955, and 79,561 in 1954. Much of this increase came from the Autlan deposit in the state of Jalisco, and the Parain deposit in the state of Oaxaca. Bethlehem Steel Corporation has a substantial interest in the Autlan deposit which produced about 100,000 tons of ore.

It is surprising to note that mercury production decreased by about 25 percent (from 1,040 metric tons in 1955 to 726 tons in 1956) despite the number of small mines opening during the year. Many of these properties were in the states of Zacatecas, Guerrero, and Durango.

Iron ore has shown a steady increase in the past few years (305,448 metric tons in 1954, 442,050 in 1955, and 502,729 in 1956). A study made in 1956 under the sponsorship of the Bank of Mexico and the domestic iron and steel industry estimated that the country's iron reserves now total 522,800,000 tons. Principal source at present is the Cerro del Mercado field in the state of Durango, with a potential of 50,000,000 tons or nearly one-tenth of the national reserves.

Pan American Sulphur Company which is building a $5,000,000 sulphur processing plant at Jaltipan in southern Vera Cruz, produced about 600,000 tons of sulphur in 1956. The new facilities are expected to raise this figure to 1,000,000 tons. Texas Gulf Sulphur Company completed its Frasch processing plant at Nopalapa Dome on the Isthmus of Tehuantepec, and on February 7, 1957 it actually went into operation. The Cia. Exploradora del Istmo, S.A., a wholly owned subsidiary, is carrying out the work which includes dredging a two-mile canal from the Coachapa River to the plant site.

During the year, Minerals Engineering Company of Grand Junction, Colorado, acquired a controlling interest in Minas y Minerales S.A. which owns tungsten deposit in the state of Sonora. Plans were underway to install a 400-ton-per-day mill at the mine and to have it in operation by the end of the year. A five-year contract was signed with Darby & Company of London, England to supply up to 5,000 units of tungsten monthly.

Mine Production of Metals and Minerals In Metric Tons In Mexico in 1953, 1954, 1955 and 1956

Commodity	*1953*	*1954*	*1955*	*1956*
Gold	15,037	12,303	11,526	11,287
Silver	1,489,435	1,247,207	1,461,791	1,363,803
Copper	60,148	52,006	54,245	52,924
Lead	221,548	211,681	211,211	204,406
Zinc	226,538	198,106	274,581	250,270
Iron	331,175	305,448	442,050	502,729
Manganese	78,738	79,561	37,078	487,608
Antimony	3,686	3,880	3,807	3,853
Mercury	401	506	1,040	726
Graphite	30,331	20,435	33,412	30,766
Tungsten	408	431	370	236
Arsenic	1,998	2,722	2,976	2,436

In 1956 San Francisco Mines of Mexico, Ltd. set a new record for tonnage of ore milled, for the fifth year in a row. The higher output in recent years has been coming from stopes at deeper levels. To accommodate this work, a larger hoist is being installed to replace the existing one. By year's end, the necessary excavation work and a new transformer house had been completed. Despite the record tonnage during the year, ore reserves were further increased by some 60,000 tons to 5,073,000 tons—at least a six-year supply for the mill.

NICARAGUA

La Luz Mines Ltd., made an overall net profit of $477,775 during the fiscal year ended September 30, 1956. A loss of $141,210 had been reported in the previous year. Much of the recent profit came through the sale of investments, however, since the mine would have been in the red without the additional revenue.

Daily tonnage milled at Siuna in 1956 averaged 1,883 tons as against 1,921 tons in 1955. Total tons milled was 689,055 from which 69,587 ounces of gold were obtained, as compared with 701,300 tons and 67,913 ounces in 1955. The tonnage decrease was caused by a cave-in in the main ore pass system below the 750-foot level.

The investment sale was made in order to supply additional financing for the Rosita Mines copper-gold property. The latter is a wholly owned subsidiary of La Luz which is being brought to the production stage as quickly as possible. The property is estimated to contain 3,582,000 tons averaging 2.91 percent copper and 200,000 tons grading 5.0 percent copper. Construction work was retarded somewhat by severe weather conditions. Production is now scheduled for the early part of 1958. A 500- to 600-ton-per-day mill will be located on the property.

PERU

The Peruvian mining industry set record production figures for output of gold, copper, lead, and iron ore in 1956, as the table indicates. The iron ore increase came largely from Marcona Mining Company's operations near the Port of San Juan where production has been rising steadily since its start in 1953. Utah Construction Company and Cyprus Mines Corporation are joint partners in this venture. Toward the end of 1956, the company began to sink a shaft in order to explore lower ore beds. Until then, the property had been entirely an open-pit operation.

Lead and zinc production may rise even higher in 1957 with several firms in the process of constructing concentrators. Sindicato Minero Rio Pallanga, S.A. is building a second plant to increase capacity from 300 metric tons of lead-zinc ore daily to 500 or 600 tons. A six-by-six-foot ball mill was acquired in 1956 and a small heavy media separation plant is also being added.

Cia. Minera Atacocha S.A. increased capacity of its Chaprin hydroelectric plant last year by the addition of a third generating unit. This plant is located about 14 miles from the firm's concentrator. Current mill throughout is about 1,000 tons of lead-zinc ore daily, with traces of silver and gold.

Cerro de Pasco Corporation was enlarging its electrolytic zinc plant from

Metal Production in Peru for 1953, 1954, 1955, and 1956

Metal	*1953*	*1954*	*1955*	*1956*
Gold[1]	4,391,593	4,585,397	5,310,837	6,040,382*
Silver[2]	611,205	634,694	713,751*	694,502
Copper[3]	35,401	38,425	43,403	46,550*
Lead[3]	114,580	110,066	118,751	129,074*
Zinc[3]	139,102	158,562	166,082*	155,072
Antimony[2]	963,377	845,817	870,595	N.A.
Bismuth[2]	286,632	313,767	333,264	N.A.
Cadmium[2]	10,370	30,083	62,579	N.A.
Mercury[2]	—	2,669	5,193	N.A.
Iron ore[3]	853,553	1,281,598	1,059,377	2,200,246**
Manganese[3]	756,163	2,832,542	3,448,000	N.A.
Tungsten[2]	544,854	462,474	486,155	N.A.
Vanadium[2]	591,071	339,285	126,785	N.A.
Selenium[2]	—	2,000	3,368	N.A.
Thallium[2]	—	—	25	N.A.
Tellurium[2]	—	—	1,062	N.A.

1. Grams.
2. Kilograms.
3. Metric tons.
* Record annual production.
** Probably the result of heavy sales of stockpiled fines to Germany.
N.A. Not available.

the present 35 tons to 90 tons per day and also seeking remedies encountered in operation of the electrothermic zinc plant. Both should be functioning at full capacity in 1957 when the Paucartambo hydroelectric plant is completed.

During last year, Cerro de Pasco also made plans for construction of a heavy duty highway from the Antamina copper deposit, which it has been exploring for years, to the Cerro de Pasco railway. The deposit is estimated to contain more than 70,000,000 tons of better than 1.0 percent copper ore. The company also is re-equipping an old open pit between the Lourdes shaft and the Paragsha concentrator to mine 1.0 to 1.2 percent copper ore. To treat this, the Paragsha concentrator's copper section was expanded from 1,200 to 1,400 tons ore daily capacity.

Biggest copper project now is that of Southern Peru Copper Corporation at Toquepala, where development work continued throughout last year. A Diesel plant was completed for power, and by the end of the year two 8-cubic-yard electric shovels were stripping. A contract was let for all construction other than mine stripping and the pier at the port of Ilo. Total expenditures by Southern Peru Copper during the year totaled $32,500,000. The company is a joint operation of American Smelting and Refining Company, Cerro de Pasco Corporation, Newmont Mining Corporation, and Phelps Dodge Corporation.

SURINAM

Bauxite exports from Surinam reached an all time high of 3,482,500 metric tons in 1956. In 1955 exports were 3,062,000 metric tons. Bauxite exports were valued at $24,000,000 in 1956 and $21,000,000 in 1955.

The Moengo mine of Surinam Bauxite Company, Ltd. also made record shipments of 2,138,000 metric tons including 127,500 tons calcined ore, and 77,500 tons chemical ore. Moengo started production of a new ore grade, i.e. calcined fines, 90 tons being shipped in 1956.

From the Paranam mine of Surinam Bauxite Co. 759,500 tons were shipped in 1956. Development of the deeper ore bodies continued. The suction dredge, ordered in The Netherlands to handle the tremendous amount of overburden covering the deeper ore bodies, was launched in November 1956. Following the successful results of the pilot plant a heavy media separation plant was erected at Rorac near the Paranam mine to treat the low grade ferruginous bauxite on a commercial scale. Total net profits of Surinam Bauxite Co. amounted to $5,250,000, i.e. $1.81 for each metric ton shipped. In 1956 the company invested more than $3,500,000 in Surinam.

Negotiations were opened between the government and the Aluminum Company of America concerning the Brokopondo multi-purpose hydroelectric project. The includes the building of a 160-foot high dam on the Surinam River some five miles upstream from Brokopondo and the construction of a 150,000 KW hydroelectric power plant. Cost is estimated at about $60,000,000. ALCOA will participate by building near Paranam, an aluminum reduction plant and an alumina plant producing about 30,000 to 40,000 tons of aluminum a year. In return the government will reserve the country's whole northeastern part for ALCOA's bauxite exploration on which the company may spend some $5,000,000.

Billiton Company of Surinam, Ltd. shipped 585,000 tons of bauxite (mostly metal grade) from its Onverdacht mine. The company concluded a long term delivery-contract with Olin Mathieson Chemical Corporation which will enable the company to augment the Onverdacht output to a regular 750,000 tons a year.

Reynolds Surinam Mining Co., Ltd. and Guiana Exploration Co., Ltd. (Kennecott Copper Corporation) continued the bauxite explorations in the coastal area. No discoveries have been reported.

Gold shipments to Paramaribo totaled 6,700 ounces against 7,210 ounces in 1955. Sara Creek Goldfields, Ltd. shipped 3,510 ounces. The company is considering having part of its Lawa properties dredged by a United States combination.

The Government Geological and Mining Service located a manganese occurrence at Maripa Hill near Dam some 80 miles south of Paramaribo. The deposit is now being thoroughly investigated by Surinam Mining Co., Ltd. (Union Carbide & Carbon Corporation.) The Company also finished preliminary prospecting for tantalite-columbite southwest of Bigiston on the Marowijne River. The results seem to warrant further exploration.

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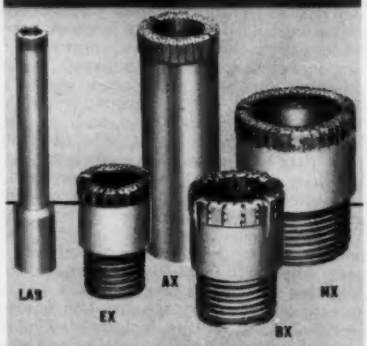

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NORTH AMERICA

CANADA

Canada's booming mining industry continued to smash all previous production records again in 1956. For the second straight year over $1,000,000,000 worth of metal ore was blasted from underground stopes and open pit benches. The 1956 figure of $1,134,354,370 was 12.6 percent above the previous year. Great expansion and development programs are underway in the aluminum, copper, iron ore, nickel and uranium industries. New asbestos (Quebec) and potash projects (Saskatchewan) are progressing rapidly. Export of minerals, ores and metals brought more revenue into Canada last year than any other single industry. It has been estimated that mineral products accounted for nearly 28 percent of the export trade during 1956.

A major event in 1956 was the announcement by International Nickel Company of a $175,000,000 development in Northern Manitoba's Mystery-Moak Lake area which contains immense low grade nickel deposits. Plans include development of two nickel mines, smelter and refinery processing, rail and hydro-electric construction. Some 70 miles east of Flin Flon, Manitoba, Hudson Bay Mining & Smelting Company indicated that three major new properties had been discovered. Two of the deposits contain copper ore and the third is zinc. Sherritt Gordon Mines stabilized production of 20,000,000 pounds of nickel annually from the Lynn Lake refinery. In Southeastern Manitoba, Montgary Mines Ltd. was reportedly developing a lithium deposit containing 8,000,000 tons of 1.85 percent LiO_2.

Metal Production and Values in Canada, 1954, 1955, and 1956

Metal	1954[5] Quantity	1954[5] Value	1955[5] Quantity	1955[5] Value	1956[1] Quantity	1956[1] Value
Antimony[2]	1,302,333	$ 349,249	2,021,726	$ 563,345	1,820,000	$ 576,300
Bismuth[2]	258,675	572,183	265,896	572,362	273,007	494,157
Cadmium[2]	1,086,780	1,847,526	1,919,081	3,262,439	2,258,184	3,838,913
Cobalt[2]	2,252,965	5,912,997	3,318,637	8,563,700	3,685,956	9,372,670
Copper[2]	605,464,042	175,712,693	651,987,423	239,756,455	706,585,547	291,469,615
Gold[3]	4,366,440	148,764,611	4,541,962	156,788,528	4,378,862	150,808,010
Indium[3]	477	1,278	104,774	232,598	358,000	805,500
Iron Ore[4]	7,361,598	49,666,507	16,283,177	110,435,850	22,526,311	156,327,885
Iron Ingots[4]	90,562	2,910,663	115,955	4,831,845	157,000	6,339,000
Lead[2]	436,990,488	58,250,831	405,525,038	58,314,500	373,349,551	57,906,514
Magnesium and Calcium[2]		4,101,642		6,585,409		5,617,826
Molybdenum[2]	752,417	457,912	1,389,177	823,954	1,452,028	967,461
Nickel[2]	322,557,961	180,173,392	349,856,992	215,866,007	355,986,460	223,343,992
Palladium, Rhodium, Iridium, Ruthenium, etc.[3]	189,350	7,956,087	214,252	8,321,633	161,600	6,495,065
Platinum[3]	154,356	12,950,469	170,494	14,747,732	150,000	15,585,000
Pitchblende		26,467,574				
Selenium[2]	323,529	1,617,645	427,109	3,203,319	508,000	8,858,000
Silver[3]	31,117,949	25,907,870	27,984,204	24,676,472	28,794,573	25,831,612
Tellurium[2]	8,171	14,300	9,014	15,774	24,000	42,000
Tin[2]	333,788	263,359	492,781	408,030	611,000	521,550
Titanium[4]	1,541	9,462	1,464	10,634	4,443	37,100
Tungsten concentrates (WO_3)[2]	2,170,633	5,795,781	1,942,770	5,508,437	2,206,662	6,060,992
Zinc[2]	752,982,353	90,207,285	866,714,038	118,306,466	847,239,825	125,476,218
Uranium		26,467,574		26,031,604		39,577,000
Total value		$ 799,911,316		$1,007,838,513		$1,134,352,470

1. Preliminary estimate 2. Pounds 3. Ounces 4. Tons 5. Tabulation by Dominion Bureau of Statistics

At the end of 1956, the shaft being sunk by Potash Company of America near Saskatoon, Saskatchewan, was down 800 feet. Emphasis continued on exploration and development of uranium properties in the Beaverlodge area of Saskatchewan. Gunnar Mines Ltd. expanded uranium milling capacity from 1,250 tons daily to 1,650 tons during 1956. Eldorado Mining & Refining Company began a mill expansion program at Beaverlodge to increase capacity from 700 tons to 2,000 tons per day.

Copper, nickel and iron shared the spotlight in Ontario. Nickel output from the Sudbury basin was up. International Nickel Company put into production the first unit of a new $19,000,000 plant to extract pyrrhotite iron ore from the nickel ores of the district. Both International Nickel Company and Falconbridge Nickel Mines, Ltd. are carrying out long-range, extensive plant expansion programs. A new copper-zinc mining area is being developed near Manitouwadge Lake, and two mines were scheduled to begin production early in 1957. At the end of the year shaft sinking had been completed at the Geco mine and a Koepe friction hoist installed. Daily capacity at the Geco mine is expected to be 3,300 tons. Shaft sinking at the Willroy Number 1 shaft was also completed and underground development started during 1956 to put this property into production at 750 ton per day rate.

Activity continued at a fast pace in the Blind River district of Ontario. Algom Uranium Mines, Ltd. started milling at the Quirke Lake and the Nordic sites. Pronto Uranium Mines continued to produce and mill some 1,500 tons of ore per day. Construction and development is being rapidly pushed at 10 other properties, and most of them should be in operation by 1957. Bicroft Uranium Mine became the first producer in the Bancroft area of Eastern Ontario when a 1,000 ton per day milling operation was started in October 1956.

Iron ore output from the Steep Rock Range about 100 miles west of Port Arthur increased to 3,374,516 tons in 1956, an increase of more than 800,000 tons over the previous year. Steep Rock Mines Ltd. began production from the Errington underground mine. Most of the company's output however, is still coming from the open pit at the Hogarth orebody. Dredging is still continuing at the "G" orebody lying between these two. Caland Ore Company is still draining a lake and dredging a property estimated to contain at least 100,000,000 tons of high grade iron ore. Algoma Ore Properties Ltd. conducted development work aimed at bringing the Sir James orebody (near its presently producing Helen Mine) into production in 1957. A new sinter unit will be installed at Jamestown to handle the increased production.

Drilling activity was conducted over a wide area in the Chibaugamou region in Quebec. The drop in copper prices dampened speculative interest, but the announcement of participation of the Patino interests in Copper Rand proved the attraction of the area for major mining interests. Three mines have come into production in the Chibaugamou area with prospects of several other possible producers in two to three more years. Lake Asbestos of Quebec, Ltd., a subsidiary of American Smelting & Refining Company, has removed about 17,000,000 cubic yards of material from Black Lake in preparation for asbestos mining operations. Dredging of silt and lake-drainage is proceeding on schedule with about half of the silt overlying the orebody removed at the end of 1956. Additional overburden must be handled mechanically. Plans call for the milling of asbestos ore to begin by mid-1958.

Intensive exploration in the Bathurst area of New Brunswick which has been so successful over the past five years continued during 1956. Metallurgically the galena-sphalerite-chalcopyrite ore is difficult to treat, and this has been a primary factor in delaying production.

In British Columbia, copper exploration in the Highland Valley has met with considerable success. Consolidated Mining & Smelting Company of Canada again was the largest producer of lead and zinc.

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ASIA

BURMA

The Burmese government, through its Mineral Resources Development Corporation, took an increased interest in mining and mineral research in the country during 1956. This was necessary in order to obtain foreign exchange by the export of minerals to replace losses caused by lower cash prices for rice exports, and by nonavailability from sales of rice to barter deals with the Communist bloc.

Burma Corporation (1951) Ltd., a joint venture of the London company and the Burma government, declared a 10 percent dividend in 1956. Exports of lead, zinc, silver, and other minerals realized nearly £3,000,000. The company reports that its ore dressing plant is being enlarged so mineral output for this firm should increase during 1957.

On October 1, 1955, the Burmese government formed another joint venture with the Anglo-Burma Tin Company Ltd. This company had two tin properties in the Mergui district, and a rich tin property 42 miles from Tavoy. The Hpolontaung tin deposit at Heinda rises 1,400 feet above sea level. The shafts proved the deposit to be not less than 700 feet deep, and good values have been established to a depth of over 200 feet. A recent appraisal of the ore reserve in one section of the Hpolontaung deposit is estimated to contain some 7,800 tons of cassiterite, or 5,600 tons of metallic tin, in some 11,000,000 cubic yards of alluvial wash covering 96 acres.

The government reopened negotiations with the Mawchi Mines Company Ltd., which recently raised £450,000 to rehabilitate its wolframite mine in the Shan States after freeing it from insurgent hands. Before World War II this mine produced 6,000 tons of mixed wolframite-tin concentrates per annum. At present there is a small production which will rapidly be increased when the labor force is recruited.

During 1956 exports of wolframite from the Mergui district were small, while exports from the Tavoy district were similar to those of 1955. Mixed tin-wolframite concentrates from the Mergui district dropped 197 tons in 1956 as compared with 1955. The government's Yadanabon mine exported only 98 tons in 1956 as compared with 315 tons in 1955. Exports of tin from the Mergui district dropped 116 tons because of the exhaustion of the Thabawleik dredging area. From Tavoy district there was a slight increase of 30 tons.

The Mineral Resources Development Corporation tested a very large zinc carbonate deposit at Loughkheng in Mongpawn, Southern Shan States. Very favorable reports have been received from geologists examining the deposit. At present road conditions are not good; a 28-mile, all-weather road will have to be built. The original estimates that there are 35,000 metric tons of ore containing 40 percent zinc have now been found to be much lower than what actually exists. The government wants to interest foreign capital in financing and developing the deposit.

During the year, government geologists tested an iron deposit near Tavoy. Diamond drill holes gave poor results. Near Taunggyi in Central Burma, an iron ore deposit said to contain 20,000,000 tons of high-grade iron ore is being investigated. The government is negotiating with some foreign interests for erection of a smelter.

CEYLON

The year 1956 was one of quiet activity in the graphite mining industry which continues to be the principal mineral industry of Ceylon. The mines of Ceylon produce high quality graphite of both the crystalline and amorphous grades. The large mines worked continuously throughout the year. There was a drop of about 7 percent in the total exports. However, Ceylon can step up production considerably, should the demand warrant.

The principal graphite mines are worked by Messrs. Bogala Graphite Ltd., Kahatagaha Mines Co. Ltd. and H. L. De Mel & Co. Ltd. These mines have undertaken bold development programs, although the present demand is not very satisfactory.

Ceylon Graphite Exports 1951 Through 1956 In Long Tons

Year	*Quantity*
1951	12,621
1952	7,659
1953	7,218
1954	7,755
1955	9,878
1956	9,207

Gemstone mining continued and while no figures for production or value are available it may be estimated that about 1,500,000 Rupees worth of gemstones are produced annually. The principal varieties produced are the ruby, sapphire and its star varieties, cat's eye, zircon, topaz, aquamarine and moonstone.

The experimental plant for the treatment of beach sands for the recovery of monazite resumed operations once again about the middle of the year. At year's end only No. 2 grade monazite assaying approximately 70 percent rare earth oxides was produced. A stock pile of about 150 tons of No. 2 grade monazite awaited further treatment.

CYPRUS

A United States company—Cyprus Mines Corporation—continued as the most important mining firm on the island during 1956. The firm has concessions covering 48.27 square miles on which four mines have been developed. Only one mine, the Mavrovouni, operated during the year to produce 933,685 long dry tons of ore compared with 783,321 in 1955. The table shows metal and concentrate production. Exploration continued at the Skouriotissa, Mathiati, and Apliki mines during the year.

Hellenic Mining Company Limited holds a total of 42.55 square miles of mining leases, in the areas of Kalavassos-Asgata, Mitsero-Agrokipia, and Kambia-Sha, and 32 prospecting permits in various parts of the island. Development of important pyritic ore bodies was continued in the Mitsero-Agrokipia mining lease area and erection of an up-to-date pyrites beneficiation plant, in the same area, was completed and will commence operation in March, 1957. Plans are proceeding for a second loading installation, on the north coast, besides the existing one at Vassiliko. The average number of men employed during the year was 1,633 and production of pyrites amounted to 299,857 tons against 290,000 tons during 1955.

Exports of Minerals From Cyprus in 1956

Mineral	*Long Tons*
Iron pyrite	821,727
Cupreous concentrate	119,211
Cement copper	3,700
Chromium ore	5,826
Asbestos	12,505
Gypsum, rock	25,424
Gypsum, calcined	3,023
Umbers	4,748

Gypsum and Plasterboard Company, Ltd., a subsidiary of the Hellenic Mining Company Limited, worked deposits of gypsum in the Kalavassos-Vassiliko area and operated its plaster and plasterboard plants at Vassiliko. A total of 40,863 long tons of gypsum rock was quarried during the year of which 25,424 tons were exported, 2,013 tons sold locally and 11,937 tons fed to the plaster plant. Production of gypsum plaster amounted to 10,589 tons of which 1,930 tons were exported.

Cyprus Asbestos Mines Ltd. has a lease over practically all the asbestos bearing area on Cyprus. Mining operations were, as usual, carried out during the dry months of the year from April to November. During the working season

Production of Metals and Minerals In Burma For Key Years From 1939 to 1955

Year	*Silver*[1]	*Tin Concentrate*[2]	*Wolframite Concentrate*[2]	*Lead*[2]	*Zinc Concentrate*[2]	*Copper Matte*[2]
1939	6,175,000	5,441	4,342	77,180	59,347	7,935
1948	415,099	1,768	378	11,596	2,943	115
1949	75,199	1,469	278	1,481	——	38
1950	——	1,750	165	371	——	——
1951	280,270	1,295	483	5,035	——	254
1952	54,783	1,306	792	9,093	4,275	134
1953	645,970	1,114	767	9,846	6,275	80
1954	1,278,289	816	443	22,561	11,283	224
1955	1,537,895	673	578	28,015	14,423	358

1. Ounces. 2. Metric tons.

Mineral Production of Cyprus Mines Corporation in 1954, 1955, and 1956

Commodity	*1954*	*1955*	*1956*
Copper Concentrates[1]	73,289	86,351	101,689
Cement Copper[1]	2,314	3,225	3,094
Cupreous Pyrites[1]	75,614	100,003	142,732
Gold in Copper Concentrate[2]	6,302	6,467	7,163
Silver in Copper Concentrate[2]	60,890	62,381	69,988
Flotation Pyrites[1]	452,805	500,778	587,723

1. Dry long tons. 2. Fine ounces.

Exports of Pyrites Produced by Hellenic Mining Company Ltd. in 1954, 1955, and 1956 in Tons

Country	1954	1955	1956
Western Germany	140,818	148,761	202,534
United Kingdom	38,849	43,240	—
Holland	34,109	38,962	47,735
Switzerland	3,376	10,206	—
Italy	—	23,448	44,591
France	—	5,659	3,937
Totals	217,152	270,285	298,797

of 1956 a total of 1,210,000 tons of rock was quarried against a total of 1,504,544 tons in 1955. This tonnage yielded 400,-708 tons of raw material compared with 409,941 tons in 1955. Recovery of marketable asbestos fiber amounted to 15,400 short tons against 15,306 short tons in 1955. Total exports were 14,010 short tons, against 14,251 short tons in 1955, mainly to United Kingdom, Eire, Denmark, Sweden, Norway, Austria, Siam, and Israel. The average number of men employed during the working season was about 1,700 against 500 during the winter months.

The Cyprus Sulphur and Copper Company Ltd. is reported to have continued their activities in 1956. Production and export figures were not made available for the Yearbook.

The Cyprus Chrome Company Ltd., of Ayios Nicolaos continued operating the chrome ore mine on Troodos. A total of about 5,800 tons was exported.

GOA

The Suez Canal crisis caused a temporary and partial paralysis in the export of iron and manganese ore from Goa to Europe and the United States during the months of November and December 1956, and January 1957. However, the ships which were in the harbor when the shooting started, took full loads at the increased freight rate via the Cape of Good Hope. Since their departure, great difficulty was experienced in chartering freighters to the above countries.

However, mine production continued on a full scale, but there was huge ore stockpiling. This should be shipped soon after the Canal is made navigable for ships up to 10,000 tons.

The exports to Japan were not affected. Even though exports to Europe and the United States had to be held up in the months of November and December 1956 there was marked improvement in the export figures over 1955.

The mining industry looks hopefully for the mechanization of the sixth loading berth at Mormugao Harbor, which is expected to take place in the very near future. This will be the first mechanized berth in Goa with a theoretical loading capacity of 2,500 tons per hour. At present most of the ore exported is loaded in stream.

Exports of Iron and Manganese Ores In Tons From Goa in 1956 With Countries of Destination

Country	Iron Ore	Manganese Ore
Japan	1,112,469	2,800
Italy	415,070	27,355
West Germany	385,936	40,897
Yugoslavia	20,060	—
Austria	86,850	5,000
Poland	19,035	—
Hungary	7,350	—
United States	—	39,029
France	—	24,966
Belgium	—	8,200
Norway	—	7,100
Holland	—	7,000
TOTALS	2,046,770	162,347

Production of Metals, and Ores in Hong Kong for the Years 1949 Through 1956

Commodity	1949	1950	1951	1952	1953	1954	1955	1956
Iron ore[1]	59,181	169,374	160,684	127,512	123,200	90,800	115,000[3]	122,963[3]
Tungsten conc.[2]	—	—	44,149	217,599	313,721	60,335	51,548	53,500
Tin ore[2]	800	1,000	2,514	1,188	156	—	—	—
Molybdenum[2]	—	—	250	737	3,327	193	52	—
Lead[1]	—	—	176	752	645	368	384	198.65
Graphite[1]	—	—	—	—	200	1,840	1,535	2,442
Kaolin and Clays[1]	—	—	620	4,381	5,934	6,063	5,342	5,463

1. Metric tons. 2. Pounds. 3. Concentrate.

HONG KONG

Throughout 1956 the most important minerals mined commercially in Hong Kong were iron, kaolin, quartz, feldspar and graphite in that order of importance. Due to low prices there were only very small outputs of wolframite, galena, and molybdenite. There was no production of beryl which had been reported the year before. It is understood that the grade of the beryl samples submitted was too low in beryllium and the known reserves too limited.

The increased output of the local ceramic factories led to an increased demand for high quality quartz and orthoclase feldspar. The production of both these minerals increased enormously during the year. The local Hong Kong granite has numerous pegmatite zones which yield good quality potassium feldspar that is suitable for glazes on both pottery and enamelware.

The Ma On Shan iron mine continued to produce a monthly average of about 10,000 tons of magnetite concentrate. There is a modern beneficiation plant operating below the mine close to the sea shore. This was installed in 1954 by a Japanese company. The average iron content after beneficiation is 51 percent. Most of the present output was shipped to Japan. Occasionally some is shipped to Formosa.

Prospecting continued throughout the year mainly by private enterprise. The Superintendent of Mines issued a number of prospecting licenses. The Geological Department in the University of Hong Kong, in the absence of a Government Geological Department, works closely with the Mines Department.

Generally 1956 was a year of low prices and in consequence there was no real incentive for new mining enterprises. The low price of tungsten was such as to preclude mining. A few hundred miners still pan the stream beds for placer wolframite. When high prices prevail for tungsten then almost certainly the 10,000 miners who were operating in 1953 will return to work.

The Mines Department increased its staff and there is now a Superintendent of Mines aided by two assistants.

INDIA

Iron and steel production occupied much of India's attention in 1956. Prospecting by the Geological Survey of India indicated that nearly 27,000,000 tons of iron ore were located in the Tomaka and Kansa areas of Cuttack district in Orissa. A contract was signed by the Tata Iron and Steel Company Ltd. and Kaiser Engineers Division of Henry J. Kaiser Company to design and build a $130,000,000 steel plant expansion unit at Jamshedpur. The project will increase India's current steel capacity by 45 percent. Other steel plants are already under construction by German, British, and Russian groups, and one of the latest offers came from Czechoslovakia. An agreement negotiated during the year between the Austrian Iron and Steel Works (VOeST) and Krupps of Germany resulted in a project for building an oxygen jet converter plant in India. Planned capacity is 1,000,-000 tons of steel annually. India also placed an export quota on iron ore during the year.

An export duty, as well as a quota, was placed on manganese ore in 1956. Reportedly, the duty could bring high-grade manganese ore prices to about $1.64 per unit at Atlantic ports, with the duty about 13 cents per unit or nearly three times as high as United States import duty. India supplied 32 percent of United States manganese imports in 1956, but this may decrease if the Indian government continues its policy of nationalizing industry. Central Provinces Manganese Ore Company Ltd. continued to diamond drill during the year at its Tirodi, Munsar, Gumgaon, and Ukwa mines. Exploration is being undertaken chiefly to prove the beds in connection with the company's open-pit operations at these properties.

India also announced plans for expansion of aluminum production during the year. The annual rate of 7,500 tons will be raised to 40,000 tons; three new smelting plants will be erected, an existing plant will double its capacity, and bauxite output will increase. One plant will go into production during the Second Five Year Plan (1956-1961) and the other probably in 1962. The Indian Aluminum Company of Calcutta obtained government approval for erection of a 10,000-ton-per-year smelter at Hirakud in Orissa. To provide the needed raw materials, India's bauxite output must be raised from 75,000 tons to 175,000 tons under the Five Year Plan.

The Kolar gold mines were transferred to the Mysore Government from John Taylor and Sons Ltd., under the Acquisition Act of 1956. The production of gold has decreased since 1952. The chief sources of production are Kolar Gold Mines in Mysore and Hutti Gold Mines in Hyderabad.

ISRAEL

Increases in the output of potash and phosphate rock, principal mineral commodities of Israel, were noted in 1956. Cement production remained constant. Construction of a copper precipitation plant progressed and plans were made for the erection of a gravity concentration mill and sintering plant to treat low-grade iron ore. Production of other minerals, such as clay, quartz sand, salt, etc., showed slight improvement.

Phosphate rock output advanced from 71,779 tons of beneficiated rock in 1955 to an estimated 122,000 tons in 1956. Located in the Negev desert at Oron, the deposit averages 24 percent P_2O_5 and is upgraded to 28.5 by air separation. Studies were made by the operators, Negev Phosphate Company, Ltd., into the possibility of improving the plant in order to attain a greater recovery and a higher-grade product. Recovery at present is only 30 percent. The beneficiated rock is shipped to Haifa where it is processed by Fertilizers and Chemicals, Ltd., into superphosphate fertilizer and phosphate chemicals for local consumption, although some material is exported.

Expansion of the potash production facilities located at S'dom at the south end of the Dead Sea was completed early in 1956 by the Dead Sea Works, Ltd. Difficulties encountered in running in the new flotation unit and other mechanical problems delayed increase in production rate for several months, but at year's end a monthly production rate of 6,500 tons was achieved.

Production of Minerals in Israel During 1955, 1956 in Tons

Commodity	*1955*[2]	*1956*[1]
Phosphate rock	71,799	118,000
Potash	18,000[1]	47,000
Cement	633,538	660,000
Salt	20,290	26,500
Ball & Fire Clay	6,415	7,750
Quartz sand	12,583	16,000
Gypsum	50,000[1]	50,000

1. Estimated. 2. From Statistical Bulletin of Israel.

At Timna, 26 kilometers north of the Red Sea port of Eilat, the Israel Mining Industries, Ltd., is erecting a 1,500 ton a day copper precipitation plant. The sulphuric acid unit and the crushing and screening equipment were acquired from German sources under the West German-Israel Reparations Agreement. Dorr-Oliver Company, who designed the plant, are furnishing the balance of the equipment. Plant facilities were approximately one-third completed at year's end and permanent camp structures were about half completed. An 80 percent cement copper product is to be exported for refining and sale on the world market. Scheduled for completion during early 1958, the plant will operate during its first three years on ore from an open pit mine to be located on the outcrop of the gently dipping sedimentary ore body. Mining will be carried downdip to economic limits. Development of the underground mine will not commence until 1958. A projected drilling program to prove up a possible 50,000,000 tons of ore in addition to the already proven 12,000,000 tons, averaging 1.5 percent Cu, was postponed, but is expected to be carried out in 1957 and 1958.

Investigations continued at the Haifa ore dressing laboratory of Israel Mining

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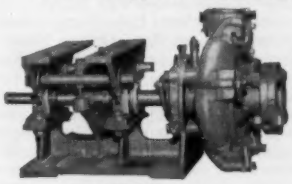
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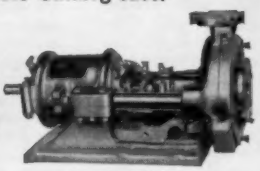
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Production of Metals and Ore in Japan in 1951, 1952, 1953, 1954, 1955, and 1956

Commodity	1951	1952	1953	1954	1955	1956[1]
Copper (electrolytic)[2]	40,866	94,385	91,065	106,478	113,316	126,156
Lead (bullion)[2]	11,116	19,148	23,145	34,114	37,126	46,307
Zinc (electrolytic)[2]	38,244	49,341	54,827	68,108	72,678	136,226[7]
Zinc (distilled)[2]	18,101	20,686	23,948	32,732	38,875	——
Mercury[2]	80.0	111.0	220	148.7[6]	172	216
Antimony[2]	221.2	543	1,197	264.4[6]	301.9[6]	——
Tin[2]	433.4	786	858	886	1,002	1,032
Pyrite (ore)[2]	2,162,344	2,567,053	2,296,389	2,677,847	2,736,143	3,058,554
Silver[3]	143,320	185,722	249,210	237,342	227,400	253,919
Gold[4]	176,900	209,210	233,890	9,374,147[5]	7,487,600	7,490,032
Titanium sponge[5]			51,902	515,414	1,249,787	2,511,698
Aluminum[2]				53,111	57,515	
Nickel[2]	——	——	——	——	3,499,720	5,663,880
Germanium[5]	——	——	——	——	102,711	370,256
Sulphur[2]	——	——	——	——	202,879	247,264

1. Preliminary. 2. Metric tons. 3. Kilograms. 4. Fine ounces. 5. Grams. 6. Content of ore. 7. Total zinc slab output.

Industries on the limonitic iron ore deposits of the Upper Galilee. Plans were being formulated for a gravity separation mill to upgrade the 27 percent Fe ore to a 42 percent concentrate for domestic use in a projected steel facility. A sintering plant to treat the concentrate has been ordered from Germany. A mineable 30,000,000 tons of ore are indicated at Manara, where the formation outcrops high on the western flank of the Hula valley.

JAPAN

Mine production of major Japanese metals—lead, zinc, tin, copper, pyrite and mercury—increased in 1956. Metal production of smelters and refineries also increased over similar 1955 figures. These plants treat both domestic mine output and imported concentrate and scrap.

Electrolytic copper production increased 13.3 percent to 126,156 metric tons. Electrolytic lead was also up 13.3 percent to 46,309 metric tons. Zinc production was 21 percent higher at 136,226 tons. The greatest gain was in nickel, 61.8 percent to 5,664 tons. Tin was up to 1,034 tons, 14.7 percent gain. Mine production of copper was 77,527 tons (72,998 in 1955), mine output of zinc was 122,651 tons.

Improvements in copper smelting included the introduction of flash smelting at Furukawa Mining Company's Ashio smelter, and the use of oxygen in blast furnaces at the Hitachi smelter of Nihon Mining Company. Mitsubishi Metal Mining Company improved convertor practice at its Naoshima smelter. Dowa Mining Company expanded capacity of its Kosaka plant.

Major copper mines continued exploration and deeper development. Especially, the Besshi mine of Sumitomo Metal Mining Company, the Hitachi and the Kawayama mines of Nihon. Favorable mine development during the year indicates two important copper mines in the future. They are the Myoho mine of Mitsubishi Metal Mining in Wakayama Ken and Yaso mine of Sumitomo in Fukushima Ken.

Lead smelters increasing capacity were: Toho Zinc Company's Chigirishima plant, the Aizu plant of Nihon Soda Company, and the Niihama fuming plant (copper slag) of Sumitomo. Mitsubishi Metal Mining Company operated its Hosokura smelter at capacity as was the Kamioka plant of Mitsui Mining and Smelting Company.

A high grade zinc-lead-pyrite ore body was discovered at the Toyoha zinc mine in Hokkaido. Mill capacity was increased to 10,000 tons monthly. Mill expansion was completed at the Nakatatsu mine of Nihon Zinc Mining Company in Gifu Ken. The Toho Zinc Mining Company purchased the Tomii zinc-lead-pyrite mine in Niigata Ken and developed it into a very promising mine.

Nickel ore is imported from New Caledonia for smelting. Nickel metal production has been expanded rapidly in recent years. Major producers are: Sumitomo Metal Mining Company, Shimura Chemical Industry Company, and Nihon Mining Company. Capacity of Sumitomo's smelter was raised to 250 tons from 150 per month. Shimura increased capacity to 450 tons per month of electrolytic nickel and raised smelter capacity from 250 to 750 tons. Nihon expanded Saganoseki nickel plant capacity to 270 tons per month of ferronickel.

Tin ore was again mined at the Ikuno and Akenobe mines of Mitsubishi Metal Mining Company and the Mitate mine of Toyo Mining Company in Kyushu.

Production of Ores and Metals In the Republic of Korea For 1952, 1953, 1954, 1955, and 1956

Commodity	1952	1953	1954	1955	1956
Gold[1]	18,636	16,100	52,250	45,654	——
Silver[1]	——	52,500	50,200	69,767	——
Copper ore[2]	9,819	10,144	7,047	13,040	14,706
Electrolytic copper	34[2]	199[2]	204,725[2]	328,930[2]	907[2]
Lead ore[2]	366	260	116	1,362	2,901
Lead bullion[2]	127	29	——	——	——
Zinc bullion[2]	312	30	——	——	——
Bismuth conc.[2]	279	638	382	407	608
Bismuth metal[2]	17	299	160	115	172
Iron ore[2]	20,577	18,831	30,996	29,135	62,867
Manganese ore[2]	7,416	3,270	1,691	3,450	1,958
Nickel ore[2]	1,060	1,126	140	——	500
Tungsten conc.[2]	3,790	7,456	3,828	2,920	3,741
Molybdenite conc.[2]	11	19	19	22	25
Alunite[2]	1,180	100	——	——	——
Tantalite ore[2]	17	——	——	——	——
Crystalline graphite[2]	254	683	713	——	528
Amorphous graphite[2]	14,806	18,744	13,200	87,900	60,586
Asbestos[2]	——	——	211	60	49
Talc[2]	3,764	9,483	8,326	6,240	6,797
Kaolin[2]	1,766	8,723	9,457	13,462	9,387
Pyrophyllite[2]	9,830	14,281	10,693	2,688	7,963
Fluorite[2] (80% CaF_2)	5,553	9,802	8,872	10,073	3,113
Columbite[2]	950	1,100	——	——	——
Monazite[2]	85	707	1,005	508	183
Tin ore[2] (5% SnO_2)	——	150	——	——	——
Barite conc.[2] (98% Ba)	——	918	305	846	675
Zinc ore	——	——	——	——	813

1. Fine ounces. 2. Metric tons. 3. Kilograms.

HASHEMITE KINGDOM OF JORDAN

Production of phosphate containing 72 to 74 percent TCP from the Roseifa mines of Jordan Phosphate Mines Company increased from 174,000 tons in 1955 to 208,000 tons in 1956. Capacity production of 310,000 tons is expected to be attained in 1957. This might be expanded to 1,000,000 tons annually when the construction of the new 8-meter-wide road from Roseifa mines through El-Hasa to Aqaba port on the Red Sea is completed. Work on the road was started and is to be finished within two years. Work at El-Hasa phosphate area was not started, but mining will soon be carried out.

Jordan has high grade gypsum deposits containing 98.9 percent hydrated calcium sulphate. Geologic observations indicate the occurrence of great quantities in many localities. Main quarry is at Wadi Muiib. Plans were being studied to use the high grade gypsum for the manufacture of sulphuric acid which will then be utilized in the manufacture of super-phosphates.

Iron ore exists in two localities, namely the Ajloun district and Wadi Sabra. Exploration work being carried out at Ajloun has proved 50,000 tons of hematite (60 to 65 percent Fe). Production may start in 1957.

Exploration work at Wadi Dana has proven quantities of manganese ore containing 33 to 53 percent Mn. Experiments to separate copper and other impurities from the manganese were carried out.

A new potash plant was being constructed on the northern end of the Dead Sea. Its annual production capacity will be 50,000 to 75,000 tons of potassium chloride and other chemical products.

REPUBLIC OF KOREA

During 1956 a concentrated effort was made to expand the mining industry in the Republic of Korea. Rehabilitation of war damaged power plants and completion of new thermal electric plants alleviated the low power supply to some mines so that output could be increased.

A most important step was taken by the Korean government to encourage mining

when it announced that a great number of government mines would be sold to private industry and that foreign venture capital would be welcomed. This followed the signing of the Treaty of Friendship, Commerce, and Navigation between the Republic of Korea and the United States in November 1956. In 1957 some 400 gold mines and 250 other mines will be auctioned by the government.

The 6.5-cubic-foot connected-bucket-line gold dredge built by Yuba Manufacturing Company under a contract with the UNKRA reached Korea in December. It is scheduled for operation in mid-1957 on a 6,962,000 cubic yard gold placer at Daechon-ni, Muan Kun, Cholla Namdo Province (southeast coast).

Two crystalline graphite deposits, of importance, were discovered during the year according to the Bureau of Mines of the Ministry of Commerce and Industry. A deposit of several millions of tons of 12 percent graphite was discovered at the Namchon mine in Kurye Kun, Cholla Namdo Province. A high grade vein type deposit assaying 40 percent graphite and containing several hundred thousands of tons was reported at the Heungbu mine in Chungyang Kun, Choongchung Pukto Province.

Engineers from several leading West German companies are to visit Korea for mine examinations and technical consulting for the proposed fertilizer plant. Increased exports of minerals would pay for building the plant under a proposed loan agreement.

An unusual gold mining operation was started in 1956 by retired United States Army general, Richard S. Whitcomb, of Holton, Kansas. He reopened the Ku-Ma mine in Kyungsang Pukto Province using Korean miners and primitive hand methods.

The Korean Tungsten Mining Company started preparatory work at its Sang Dong mine for the building of a new synthetic scheelite plant. Utah Construction Company of San Francisco, California serves as engineering consultants for the plant. Actual plant erection is scheduled for the spring of 1957. At the mine the plant site was cleared, existing buildings removed, and other preparatory work was completed during the year.

Sang Dong is one of the most important tungsten mines in the world. In addition to scheelite, bismuthenite is recovered from the ore. The new scheelite plant will remove penalty minerals from the flotation concentrate so that synthetic scheelite will enjoy a higher price and better competitive position on the world market.

FEDERATION OF MALAYA

A new post-war record was established in 1956 by the Malayan tin mines with a production of 62,295 tons which is 1.7 percent higher than the 1955 output of 61,244 tons. Metal production, estimated at 73,400 tons, represents another post-war record inasmuch as this figure is 4.0 percent greater than the corresponding one for 1955.

Although the number of tin producing units remained roughly the same, production from the dredging section continued to lose ground whereas that from the gravel-pump, hydraulic, and open-cast sections showed further increases, the number of active producing units being 784 against 781 during 1955.

The tin mining industry's three main problems were the difficulties in prospecting, taxation, and the alienation of land for mining. Amongst mining circles there is some disappointment that the report of the International Bank in reference to these had not been direct enough. As far as long-term prospects are concerned there is little doubt that ample tin deposits exist in the peninsula, but their whereabouts are less certain, for little prospecting has been possible since the 1920's. The stability in prices which the I.T.A. should achieve will help to determine those fields which can best be worked but the tendency will be for lower grade and probably deeper ores, which means employing bigger and new-style dredges, thereby reducing Malaya's advantage as a low cost producer.

Output of iron ore, the next most valuable mineral, is now after comparatively late post-war recovery back to its former level, output having been 1,000,000 tons greater during 1956 than in the previous year. It is exported mainly to Japan. Ilmenite production also increased by a considerable amount and the tonnage of 122,176 was 127 percent higher than in 1955.

Bauxite output has since 1953 exceeded the pre-war peak and during 1956 production was raised by 42,000 tons equal to 19 percent gain. Large deposits have recently been opened up in Johore where most of the mines are.

Number of Active Tin Producing Units in Malaya, end of December, 1955 and 1956

Units	*1955* *European*	*Asian*	*1956* *European*	*Asian*
Dredges	76	—	78	—
Gravel Pumping	23	611	20	613
Hydraulicing	11	3	11	2
Open Cast	2	2	2	3
Underground	1	9	1	25
Small Workings[1]	1	42	1	28
TOTALS	114	667	113	671

1. Without machinery.

Gold output from the Raub Australian Gold Mining Co. Ltd., decreased by 11 percent, chiefly because of a labor dispute.

Prospecting for uranium is to be undertaken in 1957.

Production of Metals and Minerals in Long Tons in Malaya in 1954, 1955, and 1956

Commodity	*1954*	*1955*	*1956*
Tin	60,690	61,244	62,295
Coal	224,540	206,118	182,479
Iron Ore	1,212,780	1,466,184	2,444,570
Ilmenite	44,745	53,875	122,176
Monazite	—	249	631
Tungsten	99	106	94
Columbite	111	236	277
Bauxite	165,621	222,162	264,444
Gold[1]	20,995	22,838	20,252
China Clay	1,352	1,378	1,155

1. Troy ounces.

PAKISTAN

The output of chromite, Pakistan's chief mineral, decreased due to in-

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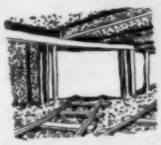

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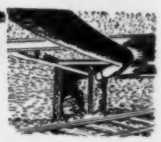

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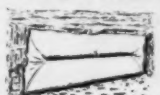

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clement weather conditions with heavy floods and snowfall. Due to these factors the output of the Kharan State mines, on which much hope was put, was much under the expectation. Frantic efforts were made to restart production as soon as possible.

Messrs. Marble and Mosaics Ltd. started a small marble cutting and finishing plant which went into production in the last months of 1956.

It is expected that in 1957, an antimony refining plant will go into production in Karachi while a unit for transforming the low grade stibnite ore into antimony trioxide will go into production in Chitral. This unit will use charcoal in the first stage while later, as soon as a small hydroelectric power station will be put into operation, electricity.

Pakistan Mineral Production in Metric Tons for 1954, 1955, and 1956

Commodity	*1954*	*1955*	*1956*
Chromite	22,000	28,495	22,746[1]
Limestone	820,000	886,500	756,400
Gypsum	31,000	28,046	36,200
Fire clay	7,000	8,145	6,100
Silica sand	14,000	9,463	10,500
Celestite	361	437	300
Ochres	628	261	400
Iron ore	714	176	3,200
Bauxite	—	1,024	3,000
Soapstone	—	259	1,100

1. Estimate.

TAIWAN

Production of the mineral commodities in Taiwan showed a steady increase in 1956 as compared with 1955. The coal output increased considerably in 1956 to keep pace with the demand of the expanding industries. Coal production in 1957 will be aimed at 3,000,000 metric tons. Two important steps were taken by the government to modernize the mining equipment and to cancel leases of nearly 400 small inactive mines so that they can be incorporated into several large-scale coal mines for proper exploitation. Geological investigations were carried out in the coal-bearing areas in central Taiwan, but no workable coal resources have been found.

Much publicity was given to the discovery of a few uraniferous minerals in the pegmatite veins in eastern Taiwan. Preliminary exploration work has been done and it is yet unknown whether promising uranium deposits will be found in the area. Sulphur production was given a great impetus by the continued demand of sulphur in the market and the sulphur output was almost doubled that of 1955. Further increase in sulphur production is anticipated in 1957. Stimulated by a high selling price of copper, mining was actively developed in the only copper mine at Chinkuashih and prospecting for other copper deposits in this area is planned for 1957.

Production of Minerals in Taiwan in 1954, 1955, and 1956

Commodity	*1954*	*1955*	*1956*
Coal[1]	2,100,000	2,359,316	2,529,046
Gold[2]	763,000	874,399	1,032,212
Placer gold[2]	—	1,338	665
Silver[2]	960,000	1,988,587	1,678,331
Copper[2]	950	1,174	1,518
Sulphur[2]	6,052	4,932	7,784
Pyrite[2]	24,860	29,019	29,438
Marble[2]	375,000	426,040	491,173
Graphite[2]	700	695	2,073
Talc[2]	5,600	5,268	6,130
Asbestos[2]	69	366	107
Serpentine[2]	—	4,475	5,057
Porcelain clay[2]	—	420	3,353
Dolomite[2]	2,600	3,222	4,543

1. Metric tons. 2. Grams

THAILAND

Increased production of tin highlighted the mining industry in Thailand in 1956. Estimated output for 1956 shows an increase of nearly 900 long tons over 1955.

A mine operators' convention was held for the first time in Bangkok for closer cooperation between the industry and the government, and to seek assistance from the government in granting mining leases in forest reserve areas.

The construction of the revolutionary deep-sea dredge by Aokam Tin Ltd., was completed, and the dredge commenced working in the sea off the island of Bhuket in February 1957.

A new company, New Chiang Pra Tin Ltd., was formed to develop the alluvial tin deposit at Huey Mood in the province of Surathani.

The purchase of the hard-rock Chon Mine by a Bangkok company received much attention. The mine was first developed about 20 years ago, but production was curtailed by transportation difficulties.

Increased prospecting activities were reported in 1956 in the provinces of Pangnga, Ranong, Surathani, and Nakorn Srithamarat.

Production of Minerals and Metals in Thailand in 1954, 1955, and 1956

Commodity	*1954*	*1955*	*1956*[e]
Tin[1]	9,776	11,108	12,000
Tungsten[2]	1,085	1,126	1,500
Antimony[2]	1,390	48	20
Lead[3]	N. A.	12,512	8,000

e Estimated.
1. Long tons metallic tin. 2. Long tons of concentrate. 3. Metric tons of concentrate. N. A. Not available.

TURKEY

There was no big business in Turkish mining during 1956. Nevertheless, some production rates were higher than in 1955. The price of chrome rose during the year, thereby stimulating interest in this mineral. However, no new finds were made and prospecting was not organized. The bad economic situation of the country provided no stimulus for foreign investment capital. Exact figures for chrome ore production in 1956 have not been published, but it appears that it will total about 550,000 to 600,000 tons. About one-third of this will have come from state-owned mines under the control of the Etibank. The latter increased their output by about seven percent.

Without doubt, the eastern provinces of Turkey will become more and more important in the coming years for prospecting and production. New mines near Sivas, Kayseri, and Divrigi have been opened but, until now, transportation has been inadequate. Fewer outcrops of chrome are being located now, however,

Metal and Mineral Production and Export in Turkey in Metric Tons in 1954, 1955, and 1956

Commodity	*1954*	*1955*	*1956*[1]
Chromite[2]			
Production	550,275	450,000	550,000
Export		542,800	759,979
Copper	18,253	23,497	24,000
Lead	1,572	1,772	1,800
Iron ore	327,506	325,000	350,000
Manganese	49,827	N. A.	N. A.

1. Estimated. 2. Includes both private and state owned mines. N. A. Not available.

which means that new methods for chrome prospecting, such as geophysics, geochemical methods, and diamond drilling, must be put into use. The reserves of chrome ore in Turkey are estimated at 3,000,000 to 4,000,000 tons. Reserves of the government-owned mines of Guleman and Sori are 700,000. The government would like to increase chrome ore output to 1,000,000 tons annually but without financial assistance and importing of mining machinery this is unlikely.

The Etibank, together with all private Turkish mining companies, founded the new Credit Bank for the mining industry during the year. Etibank holds 25 percent of the stock. Total capital is 8,000,000 Turkish lira. With this money, another new exploration company was formed; particular emphasis will be on exploration for chrome. The capital of this company is 1,000,000 lira, with half held by the Etibank and the rest by private firms. With the foundation of this bank, the Turkish state hopes to stabilize mineral prices.

The MTA Institute of Ankara investigated some deposits during the year, especially uranium. In spite of the uranium found near Bayindir, no commercially feasible deposits have been located, however. The Institute concentrated on some concessions in the southwest but no positive results were reported.

The Institute also continued its work on the geological map of Turkey which is being done on a scale of 1:100,000. A good topographic map with a scale of 1:25,000 is partially ready now and this is providing geologists with a better background for their mapping program.

Scheelite deposits have been found in two places. One south of the Uludag near Kuzbudaklar is held by Krupp of Germany which the firm hopes to mine along with the Uludag deposit itself. The other new find is near Keskin, southeast of Ankara; the MTA is investigating this. Content is said to be 0.93 percent WO_3.

The Institute also located a large colemanite deposit ($Ca_2B_6O_{11} \cdot 5H_2O$) in the vicinity of Kuthaya. Proven reserves are about 5,000,000 tons. The discovery was made while prospecting for lignite.

1956 was a year of activity in iron ore. Krupp geologists visited 34 different iron ore deposits during the year. In 1957 the best of these will be more thoroughly investigated. One near Iskenderun appears to be promising. The future of any steel plant will depend upon locating a good iron ore center.

Copper is produced only by mines under the Etibank. In 1956 this output totaled 24,000 tons. An expansion program is underway at the Murgul copper mines near the Russian border. Plans are to increase production to 12,000 tons. German, French, and English firms have received various contracts for this project.

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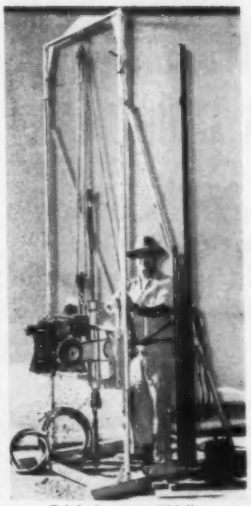

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Kennametal, Inc., Latrobe, Pa.
The Pyrites Co., Wilmington, Del.
The O. Hommel Co., Carnegie, Pa.
Shepherd Chemical Co., Highland Avenue, Cincinnati 12, Ohio.

COLUMBITE-TANTALITE

J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
Electro Metallurgical Division of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Fansteel Metallurgical Corp., N. Chicago, Ill.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
International Bartering Co., 52 Broadway, New York 4, N. Y.
Kennametal, Inc., Latrobe, Pa.
Kawecki Chemical Co., Boyertown, Pa.
Metal Hybrides, Inc., 12-24 Congress St., Beverly, Mass.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Wah Chang Corp., Woolworth Bldg., New York 7, N. Y.

COPPER

American Metal Co., Ltd., Carteret, N. J.
American Smelting & Refining Co., El Paso, Tex., Garfield, Utah, Hayden, Ariz., Tacoma, Wash.
The Anaconda Co., Anaconda, Mont.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Inspiration Consolidated Copper Co., Inspiration, Ariz.
International Bartering Co., 52 Broadway, New York 4, N. Y.
International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
International Smelting & Refining Co., Miami, Ariz.
Magma Copper Co., Superior, Ariz.
Phelps Dodge Refining Corp., Laurel Hill, N. Y.
Phelps Dodge Corp., Douglas, Ariz., Morenci, Ariz., Ajo, Ariz.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Tennessee Copper Co., Copperhill, Tenn.

DIATOMITE

American Cyanamid Co., 30 Rockefeller Plaza, New York, N. Y.
A. Daigger & Co., 161 West Kinzie St., Chicago, Ill.
General Refractories Co., 1518 Locust St., Philadelphia, Pa.
B. F. Goodrich Co., 440 S. Main St., Akron, Ohio
Hygeia Filter Co., 3422 Denton St., Detroit, Michigan.
Industrial Minerals & Chemical Co., 836-38 Gilman St., Berkeley, Calif.
Marshall Dill Division, WhitCo Chemical Co., 30 Bluxome St., San Francisco, Calif.
National Filter Media Co., Sales Div. of Filter Media Corp., 1719 Dixwell Ave., New Haven, Conn.
Standard Asbestos Mfg. & Insulating Co., 410 Olive St., Kansas City, Mo.

FELDSPAR

(Possible Buyers of Crude, Crushed, or Ground)

Akron Porcelain Co., Kenmore Station, Akron, Ohio
Ball Brothers Co., Muncie, Ind.
Corning Glass Works Co., 1943 Crystal St., Corning, N. Y.
Donnelly-Kelley Glass Co., 49 Fenlon St., Holland, Mich.
Federal Glass Co., Columbus, Ohio
General Ceramics Co., 30 Rockefeller Plaza, New York, N. Y.
Hazel-Atlas Glass Co., 1942 Dannelberg St., Wheeling, W. Va.
Knox Porcelain Corp., 150 Mynders St., Knoxville, Tenn.
Marietta Mfg. Corp., 4000 E. 15th St., Indianapolis, Ind.
Owens-Illinois Glass Co., Toledo, Ohio
Porcelain Products Co., Inc., 1941 Broadway, Parkersburg, W. Va.
Star Porcelain Co., Muirhead & Dewey Aves., Trenton, N. J.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Trenton Potteries Co., Inc., Trenton, N. J.
Wellsville China Co., Wellsville, Ohio

FLUORSPAR

(Brokers or Selling Agents)

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Balfour, Guthrie & Co., Los Angeles, Calif.
Bauer-Wilson & Bateman, 138 S. LaSalle St., Chicago, Ill.
Continental Ore Co., 500 Fifth Ave., New York City.
E. I. du Pont de Nemours & Co., 1007 Market St., Wilmington, Del.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Hickman, Williams & Co., Clark Bldg., Pittsburgh, Pa.
Kerchner, Marshall & Co., Oliver Bldg., Pittsburgh, Pa.
E. J. Lavino & Co., 1528 Walnut St., Philadelphia, Pa.
Mercantile Import & Export Corp., 21 East 40th St., New York City.
Mercantile Metal & Ore Corp., 60 Wall St., New York City.
Miller-Adick Co., Carew Tower, Cincinnati, O.
Oglebay Norton & Co., Hanna Bldg., Cleveland, O.

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The Asbury Graphite Mills, Inc., 41 Main St., Asbury, N. J.
Cummings-Moore Graphite Co., 1646 Green Ave., Detroit 9, Mich.
Joseph Dixon Crucible Co., 167 Wayne St., Jersey City 3, N. J.
Charles Pettinos, Inc., 1 E. 42nd St., New York 17, N. Y.
Superior Graphite Co., 33 S. Clark St., Chicago 3, Ill.
United States Graphite Co., 1621 Holland Ave., Saginaw, Mich.

IRON ORE

Acme Steel Co., Newport, Kentucky.
Alan Wood Steel Co., Conshohocken, Pa.
Armco Steel Corp., Middletown, Ohio.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Bethlehem Steel Company, Bethlehem, Pa.
Columbia-Geneva Steel Div., U. S. Steel Corp., 120 Montgomery, San Francisco, Calif.
Colorado Fuel & Iron Corp., Pueblo, Colorado.
Crucible Steel Co. of America, P. O. Box 88, Pittsburgh 30, Pa.
Detroit Steel Corp., Portsmouth, Ohio.
Eastern Gas & Fuel Assoc., 250 Stuart St., Boston, Mass.
Ford Motor Co., 3000 Schaefer Road, Dearborn, Mich.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Granite City Steel Co., Box 367, Granite City, Ill.
Hanna Furnace Corp., Grant Bldg., Pittsburgh, Pa.
Inland Steel Co., 3210 Watling St., E. Chicago, Indiana.
Interlake Iron Corp., 1900 Union Commerce Bldg., Cleveland 14, Ohio.
International Harvester Co., 180 No. Michigan Ave., Chicago 1, Ill.
Jones & Laughlin Steel Corp., 401 Liberty Ave., Gateway Center, Pittsburgh 30, Pa.
Kaiser Steel Corp., P. O. Box 217, Fontana, Calif.
Lone Star Steel Co., P. O. Box 8087, Dallas 5, Tex.
National Steel Corp., Grant Bldg., Pittsburgh, Pa.
Pittsburgh Steel Co., Grant Bldg., Pittsburgh, Pa.
Republic Steel Corp., Republic Bldg., 25 Prospect Ave., N. W. Cleveland 1, Ohio.
Sharon Steel Corp., Sharon, Pa.
Shenango Furnace Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal & Iron Div., U. S. Steel Corp., P. O. Box 599, Fairfield, Ala.
U. S. Pipe & Foundry Co., Birmingham, Ala.
U. S. Steel Corp., 525 Wm. Penn Place, Pittsburgh 30, Pa.
Wheeling Steel Corp., Wheeling, West Virginia.
Woodward Iron Company, Woodward, Ala.
Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown 1, Ohio.

LEAD

Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
American Metal Company, Ltd., 61 Broadway, New York 6, N. Y.
American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
The Bunker Hill Co., Kellogg, Idaho.
Combined Metals Reduction Co., Felt Bldg., Salt Lake City, Utah.
The Consolidated Mining & Smelting Co., Ltd., Montreal, Canada.
Eagle Picher Co., Mining and Smelting Div., P. O. Box 910, Miami, Oklahoma.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N.Y
International Bartering Co., 52 Broadway, New York 4, N. Y.
International Smelting & Refining Co., 25 Broadway, New York 4, N. Y.
Metal Traders, Inc., 67 Wall St., New York, N. Y.
National Lead Company, 111 Broadway, New York, N. Y.
Philipp Brothers, Inc., 70 Pine St., New York 5, N. Y.
St. Joseph Lead Co., 250 Park Ave., New York 17, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
United States Smelting Refining & Mining Co., 75 Federal St., Boston, Mass.

LEPIDOLITE

American Potash & Chemical Corp., 3030 W. 6th St., Los Angeles 54, Calif.
Corning Glass Works, Corning, N. Y.
J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
General Electric Co., Nela Park, Cleveland, Ohio.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
Pittsburgh Corning Corp., Port Allegany, Pa.

MAGNESITE AND BRUCITE

Basic, Inc., 845 Hanna Bldg., Cleveland 15, Ohio.
Corhart Refractories Co., (Corning Glass Works), 1662 West Lee St., Louisville, Ky.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland, Calif.
Northwest Magnesite Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
Pabco Products Inc., 1550 Powell St., Emeryville 8, Calif.
Standard Lime & Cement Co., 2000 First National Bank Bldg., Baltimore, Md.
Standard Slag Co., 1200 Wick Bldg., Youngstown 1, Ohio.
Westvaco Chemical Division, Food Machinery & Chemical Corp., 161 E. 42nd St., New York, N. Y.

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(Consumers of Metallurgical-grade Manganese Ore)

Associated Metal & Minerals Corp., 75 West St., New York 6, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.

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E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Keokuk Electro Metals Co., Keokuk, Iowa.
National Paint and Manganese Co., Lynchburg, Virginia.
Ohio Ferro-Alloys Corp., 100 Citizens Bldg., Canton, Ohio.
Pittsburgh Metallurgical Co., Niagara Falls, New York.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
Tennessee Products and Chemical Corp., American National Bank Bldg., Nashville Tennessee.
Tenn-Tex Alloy and Chemical Corp., 500 1st American National Bank Bldg., Nashville 3, Tenn.
United States Steel Co., 525 William Penn Place, Pittsburgh 30, Pa.

(Consumers of Battery and Chemical-grade Manganese Ores)

Acme Battery Co., 59 Pearl St., Brooklyn, N. Y.
Burgess Battery Company, Freeport, Ill.
Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
General Dry Batteries, Inc., Cleveland, Ohio.
General Electric Co., Nela Park, Cleveland, Ohio.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
E. J. Lavino & Co., 3 Penn Center Plaza, Philadelphia 2, Pa.
National Carbon Co., P. O. Box 6087, Cleveland, Ohio.
Olin Mathieson Chemical Corp., Winchester Repeating Arms Plant, New Haven 4, Conn.
Ray-O-Vac Co., Madison, Wis.
Tennessee Eastman Corp., Kingsport, Tenn.

MERCURY

Allied Chemical & Dye Corp., The Solvay Process Div., P. O. Box 271, Syracuse, N. Y.
American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.
American Meter Co., Erie, Pa.
Automatic Steel Products, Inc., Mercury Clutch Div., 1201 Camden Ave., S. W., Canton 6, Ohio.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Bailey Meter Co., 1052 Ivanhoe Rd., Cleveland 10, Ohio.
J. T. Baker Chemical Co., Phillipsburg, N. J.
F. W. Berk & Co., Inc., Woodbridge Div., Box 38, Woodridge, N. J.; Coast Chem. Div., 55 New Montgomery St., San Francisco, Cal.
E. I. du Pont de Nemours & Co., Inc., Methods Div., Du Pont Bldg., Wilmington 98, Del.
Foxboro Co., Foxboro, Mass.
General Aniline & Film Corp., General Aniline Works Div., 435 Hudson St., New York 14, N. Y.
General Color Co., 24 Avenue B, Newark 5, N. J.
General Electric Co., Purchasing Dept., 1 River Road, Schenectady 5, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
Mallinckrodt Chemical Works, Jersey City 5, N. J.
Merck & Co., Inc., Lincoln Ave., Rahway, N. J.
The Mercoid Corp., 4201 Belmont Ave., Chicago 41, Ill.
Metalsalts Corp., 200 Wagaraw Rd., Hawthorne, N. J.
Minneapolis Honeywell Regulator Co., 2753 4th Ave. S., Minneapolis 8, Minn.; Brown Instrument Div., 4331 Wayne Ave., Philadelphia, Pa.
Phillips Petroleum Co., Bartlesville, Okla.
Public Service Electric & Gas Co., Electric Dept., 80 Park Place, Newark 1, N. J.
Quicksilver Products Inc., 407 Sansome St., San Francisco 11, Calif.
Thomas A. Edison, Inc., Primary Battery Div., Bloomfield, N. J.
Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, N. J.
Wyandotte Chemical Corp., Wyandotte, Mich.

MICA

(Buyers of Muscovite Block, Film Mica, and Phlogopite Block Mica)

Aerovox Division, Aerovox Corp., 740 Belleville Ave., New Bedford, Mass.
American Mica Insulation Co., 235 Parker Ave., Manasquan, N. J.
Ashville Mica Co., P. O. Box 318, Newport News, Va.
Carpenter & Phillips, Box 657, Spruce Pine, N. C.
Cornell-Dubilier Electric Corp., 55 Cromwell St., Providence 7, R. I.
Diamond Power Specialty Corp., P. O. Box 415, Lancaster, Ohio.
J. E. DeSousa Co., Inc., 217 Broadway, New York 7, N. Y.
Farnam Mfg., Inc., Sweeten Creek Road, Asheville, N. C.
General Electric Co., 1 River Road, Schenectady, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Mica Fabricating Company, 53 Central Ave., Rochelle Park, N. J.
Micacraft Products, Inc., 701 McCarter Highway, Newark 5, N. J.
Perfection Mica Co., 20 North Wacker Drive, Chicago, Ill.
Reliance Mica Co., 341 39th St., Brooklyn, N. Y.
Spruce Pine Mica Co. and Mayland Mfg. Co., Spruce Pine, N. C.
The Tar Heel Mica Co., Inc., Plumtree, N. C.
Western Electric Co., Inc., 195 Broadway, New York 7, N. Y.

(Consumers of Mica Splittings)

Allis-Chalmers Manufacturing Co., Box 512 Milwaukee 1, Wisconsin.
American Electrical Heater Co., 6110 Cass Ave., Detroit, Michigan.
Cleveland Mica Co., 1360 Hird St., Lakewood, Ohio.
Continental-Diamond Fibre Co., Valparaiso, Indiana.
General Electric Co., 1 River Road, Schenectady, N. Y.
Mica Insulator Company, 757 Broadway, Schenectady, New York.
National Electric Coil Co., Columbus, Ohio.
Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.

MICA GRINDERS

(Buyers of Domestic Scrap Mica)

Buckeye Mica Co., P. O. Box 416, Buckeye, Ariz.—Dry.
Concord Mica Corp., 25 Crescent St., Penacook, N. H.—Wet.
International Minerals & Chemical Corp., 20 North Wacker Drive, Chicago, Ill.; plants at Kona, N. C., and Erwin, Tenn.
Deneen Mica Co., Burnsville, N. C.—Dry.
Diamond Mica Co., Spruce Pine, N. C.—Wet.
English Mica Co., Spruce Pine, N. C.—Wet and Dry.
Franklin Mineral Products Co., Box 38, Franklin, N. C.—Wet.
The Funkhouser Co., Hartwell, Georgia—Dry.
Huntley Industrial Minerals, Inc., P. O. Box 305, Bishop, Calif.—Dry.
Kings Mountain Mica Co., Inc., Box 709, Kings Mountain, N. C.—Dry.
Southern Mica Co., Johnson City, Tenn.—Dry.
Sunshine Mica Co., 12234 Los Nietos Road, Los Nietos, Calif.
Western Nonmetallics, Inc., Pueblo, Colo.—Dry.

MOLYBDENUM CONCENTRATES

J. T. Baker Chemical Co., Phillipsburg, N. J.
Electro Metallurgical Div., Niagara Falls, N. Y.
Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
Crucible Steel Co. of America, Pittsburgh, Pa.
International Minerals & Metals Corp., 11 Broadway, New York 6, N. Y.
Molybdenum Corp., of America, 500 Fifth Ave., New York, N. Y.
Republic Steel Corp., Canton, Ohio.
S. W. Shattuck Chemical Co., Denver, Colo.

NICKEL

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Cosmo Metal Alloys Co., 275 Front St., New York, N. Y.
Sulmet Alloys Co., Inc., Wellington St. and Erie R.R., Clifton, N. J.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.
United States Smelting Refining & Mining Co., 1 State St., Boston, Mass.

PERLITE

(Producers of Expanded Perlite)

Airlite Processing Corp., Bldg. 9, Air Base, Vero Beach, Fla.
American Bildrok Co., 2001 W. Pershing Road, Chicago 9, Ill.
Alatex Construction Service, Inc., 3518 Broadway St., New Orleans 18, La.
Atlantic Perlite Co., 1919 Kenilworth Ave., N. E. Washington 19, D. C.
Buffalo Perlite Corp., 100 Sugg Road (Cheektowaga), Buffalo 21, N. Y.
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Harborlite Corp., 696 Montgomery Freeway, Chula Vista, Calif.
McClure & Erickson Corp., 2416 Bedessen Ave., Los Angeles 22, Calif.
Midwest Perlite Products, Inc., 1120 Railroad St., W. Des Moines, Iowa.
Minerals Processing Corp., 520 Van Rensselaer St., Syracuse, N. Y.
Minnesota Perlite Corp., 315 W. 86th St., Minneapolis 20, Minn.
National Gypsum Co., 325 Delaware Ave., Buffalo 2, N. Y.
Ozark-Mahoning Co., Ozark Chemical Div., P. O. Box 449, Tulsa, Okla.
Panacalite Pacific, Inc., 845 E. 60th St., Los Angeles 1, Calif.
Paramount Perlite Co., 16236 S. Illinois St., Paramount, Calif.
Silbrico Corp., 5901 W. 66th St., Chicago 36, Ill.

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The American Platinum Works, 231 New Jersey R. R. Ave., Newark 5, N. J.
Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
J. Bishop & Co. Platinum Works, Malvern, Pa.
Handy & Harman, 82 Fulton St., New York 7, N. Y.
Johnson, Matthey & Co., Inc., 608 Fifth Ave., New York 20, N. Y.
Mercantile Metal & Ore Corp., 595 Madison Ave., New York 22, N. Y.
Rodman & Yaruss Refining Co., 21 W. 47th St., New York 19, N. Y.
Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco 2, Calif.
Western Gold & Platinum Works, 589 Bryant St., San Francisco 7, Calif.

PYRITE

American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
The Anaconda Co., 25 Broadway, New York 4, N. Y.
Associated Metals & Minerals Corp., 75 West St., New York 6, N. Y.
Baugh Chemical Company, Baltimore, Maryland.
Davidson Chemical Corporation, 20 Hopkins Place, Baltimore 3, Maryland.
Foote Mineral Company, 18 West Chelten Ave., Philadelphia 44, Pa.
General Chemical Division, Allied Chemical & Dye Corp., P. O. Box 4040, Denver, Colorado.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Reliance Phosphate Company, Savannah, Georgia.
Stauffer Chemical Company, 636 California St., San Francisco 8, Calif.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.

RARE-EARTH ORES

(Cerium ores, monazite sand, bastnaesite, other thorium-bearing ores)

Crane Co., 836 Michigan Ave., Chicago 5, Ill.
Davison Chemical Co., Rare Earths Div., P. O. Box 488, Pompton Plains, N. J.
J. E. De Sousa Co., Inc., 217 Broadway, New York 7, N. Y.
E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
Lindsay Chemical Co., 264 Ann St., West Chicago, Illinois.
Mallinckrodt Chemical Works, 2nd and Mallinckrodt Sts., St. Louis 7, Mo.
Maywood Chemical Works, Maywood, N. J.
Molybdenum Corp. of America, 500 Fifth Ave., New York, N. Y.
C. Tennant, Sons & Co., 100 Park Ave., New York 17, N. Y.

SELENIUM

American Metal Co., Ltd., 61 Broadway, New York, N. Y.
American Smelting & Refining Co., 120 Broadway, New York 4, N. Y.
International Bartering Co., 52 Broadway, New York 4, N. Y.
International Smelting & Refining Co., 25 Broadway, New York, N. Y.
Kawecki Chemical Co., Boyertown, Pa.

SPODUMENE

Corning Glass Works, Corning, N. Y.
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Foote Mineral Co., 18 E. Chelten Ave., Philadelphia 44, Pa.
Lithium Corp. of America, Inc., Rand Tower, Minneapolis 2, Minn.
Maywood Chemical Works, Maywood, N. J.
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STRONTIUM ORES

Associated Metals & Minerals Corp., 40 Rector St., New York, N. Y.
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Barium Products, Ltd., Modesto, Calif.
Barium Reduction Corp., Charleston, W. Va.
E. I. du Pont de Nemours & Co., Inc., 11th & Orange Sts., Wilmington, Del.
Foote Mineral Co., Inc., 12 E. Chelten Ave., Philadelphia, Pa. (minerals).
General Electric Co., 1 River Road, Schenectady, N. Y.
Chas. Hardy, 415 Lexington Ave., New York, N. Y.
Harshaw Chemical Co., 1933 E. 97th St., Cleveland, Ohio.

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American Minerals Co., 840 S. Mission Rd., Los Angeles, Calif.
Arkansas Talc Co., Inc., Benton, Ark.
Blue Ridge Talc Co., Inc., Henry, Va.
Carolina Pyrophyllite Co., Staley, N. C.
Commercial Minerals Co., 310 Irwin St., San Francisco, Calif.
Eastern Magnesia Talc Co., Inc., 206 Bank St., Burlington, Vt.
Gouverneur Talc Co., Inc., Gouverneur, N. Y.
Huntley Industrial Minerals, Inc., Box 305 Bishop, Calif.
Industrial Minerals & Chemical Co., 6th & Gilman St., Berkeley, Calif.
Southern Talc Co., Chatsworth, Ga.
Southwestern Talc Corp., Llano, Texas.
Stauffer Chemical Co., P. O. Box 68, N. Portland, Ore.

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American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.
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Vanadium Corp. of America, 420 Lexington Ave., New York 17, N. Y.

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E. A. Godoy & Co., Inc., 25 Broadway, New York 4, N. Y.
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C. Tennant, Sons & Co., 100 Park Ave., New York, N. Y.

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Orefraction Inc., 7425 Thomas St., Pittsburgh 8, Pa.
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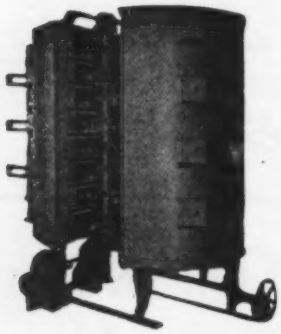

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National Lead Co., Monticello, Utah.
Rare Metals Corp. of America, Tuba City, Ariz.
Union Carbide Nuclear Co., Rifle, Slick-Rock and Uravan, Colo.; Greenriver and Thompson, Utah.
Uranium Reduction Co., Moab, Utah.
Vanadium Corp. of America, Durango and Naturita, Colo.
Vitro Uranium Co., Salt Lake City, Utah.

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Foote Mineral Co., 18 W. Chelten Ave., Philadelphia 44, Pa.
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Chairman	chmn
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Chief	ch
Company	co
Concentrator	concen
Consolidated	consol
Corporation	corp
Creek	cr
Development	devel
Director	dir
District	dist
Division	div
East	E
Electrical	elec
Engineer	eng
Flotaion	flot
Foreman	frm
General manager	gen mgr
Geologist	geol
Gravity	grav
Heavy media	heav-med
Hydraulic	hydraul
Incorporated	inc
Limited	ltd
Manager	mgr
Mechanical	mech
Metallurgist	met
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Milling	mlg
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North	N
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Partner	part
President	pres
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Secretary	sec
South	S
Superintendent	supt
Surveyor	surv
Treasurer	treas
Underground	undergr
Vice president	VP
West	W
Yearly	yrly

A CAREFUL SURVEY OF SOME 4,500 MINING and allied processing operations, both active and dormant, was the basis of this list of United States and Alaska mining operations. While MINING WORLD cannot guarantee 100 percent accuracy for this directory, it believes that the list is the best such reference available to the mining industry from any source.

FOR THE GREATEST POSSIBLE UTILITY operations are listed alphabetically by state. Listings are carried under the name of the operating company, owner, mine, or individual operator, according to the wishes of the parties concerned. In cases where properties are commonly known by more than one name, cross references were used where possible. Major companies have more than one listing. Properties and personnel are listed by states in which the mines are located. There is a cross reference to company executive headquarters and to all other states in which the company operates.

QUESTIONNAIRE FORMS covering major operating details and personnel were mailed over a period of six months. Where information supplied by the operator or owner was not complete, supplementary data was obtained from field reports compiled by staff members, records furnished by the MINING WORLD news bureau, and information from federal and state mining agencies, the United States Atomic Energy Commission, many state geologic departments, state conservation commissions, and state and regional mining associations. Special thanks are extended to the U. S. Bureau of Mines and its regional engineers for help in checking operating properties.

THE PROPERTIES WERE ALL ACTIVE and producing when surveyed, except where "under development" and "idle" have been added. Totally inactive properties with no indication of future resumption of operations were deleted. Tonnages listed are for daily production, unless otherwise noted. Minerals and metals are listed in order of importance. Key personnel are listed under the address where they may be reached, and unless otherwise specified mill and smelter addresses are the same as those given for the mines.

A SPECIAL NOTE ABOUT URANIUM COMPANIES. Only those uranium companies that are actually operating and/or made uranium ore shipments in 1956 are listed in this directory. Although MINING WORLD contacted several hundred more uranium companies and hope-to-be uranium companies than are listed on the following pages, only those which gave proof of actually being in the process of production, development, or exploration work were included. Mining companies, mine operators, etc., are listed in the state in which ore was actually mined. Headquarters of the company (producing unit) are then listed and address given even though in another state; which is often the case.

IF YOUR MINE WAS NOT LISTED in this year's directory, fill out the form below, tear it out of the book along the dashed line and mail it to MINING WORLD, 500 Howard Street, San Francisco 5, California, and your name will be added to the list receiving questionnaires for next year's directory section.

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Idle
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Haycock
PLACER, Sweepstake Cr, hydraulic-dozer, Au

BODIS, GEORGE
Box 64, Nome
PLACER, Sweepstakes Cr, Koyuk dist, Au

BOGAN, PW & MASSOZ, GEO
Box 354, Seward
EAST POINT MINE, Hope dist, lode, Au

BOTT, EARL & LYLE
Big Lake
PLACER, Valdez Cr, Au

BRANDL, PHILIP & REBECCA
Star Route, Spenard
PLACER, Nugget Cr, Yentna dist, Au

BRINKER - JOHNSON CO
141 Battery St
San Francisco, Calif
Pres: W W Johnson
VP: T Keith Johnson
PLACER on Caribou Cr, via Fairbanks 4 1/2-ft dredge, Au, Ag
Idle
(Owned by Walter W Johnson Co Dollar Bldg, San Francisco, Calif)

BURNETTE, DEWEY & HUNTER, M
Box 1995, Fairbanks
PLACER, Crooked Cr, Kantishna dist, nonfloat, Au

CANYON CREEK MNG CO
Aniak
Gen Mgr: Jens A Kvamme
PLACER on Canyon Cr, Aniak dist, Kuskokwim R reg, dozer-sluice plate-hydraulic, Au

CARLSON, IVAR C
Ophir
MINE, Little Cr, Innoko dist, nonfloat

CARSTENS, HEINE, C & DELTA
Alaska Co, Central
PLACER, Portage Cr, Circle dist, Au

CHANDALAR MNG CO
613 3rd Ave, Anchorage
Op: Hugh Matheson, Jr
PLACER, Big Cr, Chandalar dist, nonfloat, Au

CHATHAM CREEK MNG CO
Box 64, Fairbanks
Berg, Tweiten & Wickstrom
PLACER, Chatham Cr, Fairbanks dist, Yukon R reg, dragline-dozer, Au

COAST RANGE EXPLORATION CO
Box 1753, Anchorage
LODES, SE Alaska, Au

COLLINSVILLE MINES, A PARTNERSHIP
1557 H St., Anchorage
GOLD PLACER, 2,500-yd dragline & nonfloat wash pl, 100 air mi NW of Anchorage
Frm: Carl Durand
Idle

COLORADO CREEK MNG CO
McGrath
Partners: John E & Richard S Fullerton
PLACER, 60 mi N of McGrath on Colorado Cr, Au, Ag
Prod: 2,000 cu yds

CRANE, FRED & ASSOC
Kutzetue
MINES, NW & N Alaska
Under devel

CUMMINS, LARRY & NEGUS, FRED
c/o B & K Trading Co, Talkeetna
PLACER, Nugget Cr, Yentna dist, Au

DAHL CREEK MINE
709 - 5th Ave, Fairbanks
Op: C E Stout
PLACER, Dahl Cr, Shungnak dist, Au

DE COURSEY MOUNTAIN MINING CO
Red Devil
Pres: Ray Wolfe
VP: Robert Lyman
Sec-Treas: H R Heard
RED DEVIL MINE, Red Devil, undergr, Hg
Gen Mgr: Keith J Benner
Asst Gen Mgr: John D Murphy
Mine Frm: Warren Rice
Mine Eng: Dorr N Holloway
Prod: 40 tons daily
DE COURSEY MINE, 20 mi N of Crooked Cr, Kuskokwim Riv, Hg
Idle

DEGIMAN, J A MNG CO
Ophir
PLACER on Esperanto Cr, Innoko dist, dragline-dozer, Au

DONLIN PLACERS
Crooked Creek
Owner: Robert F Lyman
PLACER in Snow Gulch 19 mi N of Crooked Cr, Aniak dist, Kuskokwim Riv reg, dozer, Au

EDGECUMBE EXPLORATION CO
218 S Hudson
Pasadena 5, Calif or
Box 756, Sitka
Pres: C T Morgan
VP: C A Haley
Treas-Gen Mgr: G H Morgan
Sec: A Holden
EECO MINE, Silver Bay, undergr, Au, Ag
Idle
EECO GRAV MILL at Silver Bay
Elec Calif

FERN GOLD MNG CO
502 Columbia Bldg
Spokane, Wash
Pres: J L Drumheller
VP: Martin Woldson
Sec: L R Gordon
FERN MINE, Palmer, undergr, Au
Idle
SMELTER, Tacoma, Wash

FRANKLIN MNG CO
Tok Junction
Partners: Howard Bayless, Dick Roberts, Bob Roberts & Ellis Roberts
PLACERS at Franklin & Chicken, hydraulic, dragline, dozer, Au

FRASCA & CO
Box 1182, Fairbanks
PLACER on Eagle Cr, Circle dist, hydraulic-dozer
(Leased from Berry Holding Co)

GARDNER BAY MNG ASSOC
312 Commercial Bldg, Ketchikan
PROSPECT, Gardner Bay, Ketchikan dist, U_3O_8
Idle

GILLETTE, D F
Box 73, Nome
#3 BENCH SPECIMEN PLACER on Anvil Cr, Nome dist, Au
Under devel

GOLD CORD MINE
c/o Brown & Renshaw
Anchorage
LODE MINE, head of Fishhook Cr, Willow Cr dist, Au

GOLD PLACERS, INC
Coal Creek
Pres & Gen Mgr: E N Patty
VP: Walter Seigmon
Dirs: E B Bull & Mrs A D McRae
PLACER, Circle dist, Au

GOLD STREAM MNG CO
Box 1115, Fairbanks
Pres: D G Breaid
VP: Emil Usibelli
Sec: Charles Clasby
PLACER, Goldstream Cr, near Fox, nonfloat, Au
Mine Frm: Henry Falke

GOODNEWS BAY MNG CO INC
422 White Bldg, Seattle, Wash
Pres: A O Olson
Sec: G D Connor
Treas: C J Johnston
GOODNEWS BAY PLACER, Platinum
Gen Mgr: Edward Olson

GORE & THATCHER
Box 893, Ketchikan
MINE, SE & 1st Alaska, U_3O_8
Under Devel

GRANITE CREEK MNG CO
Ruby
Pres: Wm Carlo
VP: Wm Carlo, Jr
Sec: P Carlo
PLACER on Ophir Cr, 50 mi S of Ruby, Yukon reg, hydraulic-dozer, Au

GRANT CREEK MNG CO
Tanana, P.O. 53
Partners: Lars Indegard
Frank C Edgington
PLACER, Grant Cr, approx 25 mi W of Tanana, Au
Prod: 1,000 to 1,200 cu yds

HARD, ERIC
Ophir
BEAR CR PLACER, Folger, Au
Mine Supt: Eric Hard

HASSEL MNG CO
Box 1071, Fairbanks
PLACER, Ready Bullion Cr, Fairbanks dist, Au

HAVENSTRITE OIL CO MNG DIV
Candle
PLACER Candle Cr, Fairhaven dist, nonfloat, Au

HAYES, HOWARD
Box 1136, Douglas
PLACER, A J Mine tailings, Juneau dist, Au

HEINER, LARRY
LODE PROSPECTS, Petersburg & Kupreanof dists, Au

HOLMES, WALTER L
May Creek via Cordova
DAN CREEK MINE, Nizina dist, placer, open pit, hydraulic, Au
REX CREEK MINE, Nizina dist, placer, open pit, hydraulic, Au
Idle

HOPE MINE
c/o R V Watbine, Box 521, Fairbanks
PLACER on Deep & Faith Cr, hydraulic-dozer, Au

HUFFMAN, HALL MARCH & NICKELSON
Bethel
PLACER, Little Kasigluk Cr, Aniak dist, Au
Under devel

HUNTER CREEK MNG CO
c/o Melo Jackovich, Rampart
PLACER on Hunter Cr, Rampart dist, hydraulic-dozer, Au

HYDER MINES, INC
310 Stewart St, Seattle 1, Wash
Pres: L W Mayer
VP: L E Bigham
Sec-Treas-Purch Agt: J W Boothe
RIVERSIDE & CANTU MT MINES, Hyder undergr, Pb, Ag, WO_3, Au, Cu, Zn
Gen Supt: Evans E Collins

Geol: R W Renshaw
Under devel
100-TON FLOT MILL, at Riverside mine
Idle

I & L MNG CO
P O Box 2015, Ketchikan
Pres: Lee Hollenbeak
VP: Irma Hollenbeak
I & L MINE, on Bokan Mt near Kendrick Bay, U_3O_8
Under devel
(Under option to Union Carbide Nuclear Co, P O Box 716, Ketchikan)

I L & M MNG CO
Box 2015, Ketchikan
Pres: Lee Hollenbeak
VP: Irma Hollenbeak
Sec: Charles W Miller
I L & M MINE, Kendrick Bay, Ketchikan dist, U_3O_8
Under devel

J - B MNG CO
413 Mission St, Ketchikan
MINE, Bradfield Canal & Kendrick Bay, Ketchikan dist, Au
Under devel

JOHNSON, ERIC & MCDERMOTT, PADDY
MINE, Edgar Cr, Marshall dist

JOHNSON, HELMER
Box 938, Fairbanks
PLACER on Cleary Cr, hydraulic-dozer, Au

JOHNSON, PETE & ISAACSON
Hot Springs
PLACER on Eureka Cr Hot Springs dist

JOKELA & LAZERATION
Box 2000, Fairbanks
Part: Verne Jokela
Charles Lazeration
GREENBACK CLAIMS, 23 mi N of Fairbanks, undergr Au, Ag
Idle

JONES, R H; HARVEY C K DOHERTY, PETE
Fairbanks
HYDRAULIC, Smith Cr, Kevalik dist, Au

JURICH, JOHN & CARR TOM
Livengood
PLACER, Lillian Cr Tolovana dist, Au

KENAI CHROME CO
545 E 4th St, Anchorage
Part: John G Bachner
Part & Gen Mgr: Mike E Seiler
STAR NO 4 MINE, Red Mt, Homer Cr, undergr, Cr_2O_3
Asst Gen Mgr: Karl A Bachner
Mine Frm: Herman Crooks
Prod: 100 long tons
50-TON ROD MILL, at mine,
Mill Supt: Mike E Seiler

KENDRICK BAY MNG CO
Mines Park, Golden, Colorado
Pres: Frank Coolbaugh
VP: John J Curzon
Sec: John P Fitz-Gibbon
Treas: Thomas E Congdon
MINE, Prince of Wales Island, Alaska

KLOSS & DAVIS
Part: Herman Kloss & Jack Davis
K & D MINE, 2 mi from Sumset Cove, Petersburg dist, SE Alaska reg, undergr, Au, Ag, Sb, Pb, Zn
Under devel

KODIAK EXPLORATION CO, INC
Box 448, Kodiak
Pres: George H Cornelius
VP: Emil Knudsen
Treas: Robert von Scheele
Purch Agt: Ralph Johnson
Field Dir: Henry Neseth
KECO PINK ROCK MINE, Kodiak, undergr, WO_3, Cu, Au
Gen Mgr: Henry Neseth
Asst Gen Mgr: Tom von Scheele
Geol: Charles H Scott
Mech Eng: Walter Aches
CLAIMS, undergr, open pit, placer, U_3O_8, WO_3, As, Cu, Ni, Co, Ag

KOUGAROK FREIGHT & MNG CO
Box 137, Nome
Part: E C Straub & E Towner
PLACER, 11 mi NE of Nome, Au, dredge
Prod: 30,000 yds yearly

LA CROSS MNG CO
Boundary
PLACER, Davis Cr, Fortymile dist, Au

LAHMEYER, DAVISON & BIRUM
1808 4th, Ketchikan
PROSPECT, SE Alaska, U_3O_8

LANNING, TONY
Hot Springs
PLACER, Omega Cr Hot Springs dist, Au

LARSEN & SUCKLING
Hot Springs
DRIFT MINE, Woodchopper Cr, Hot Springs dist, Au
Idle

LAST CHANCE MNG CO
Box 639, Nome
Op: William S Muns
PLACER, Bluff, Au, bucket-line floating dredge

LAZO URANIUM ASSOC
Box 893, Ketchikan
MINE, S Arm Moira Sound, Ketchikan dist, U_3O_8, Th

LEE BROS DREDG CO
Solomon
Gen Mgr: Richard Lee
PLACER on Solomon Riv Seward Penin, bucket Au, Ag
Prod: 7,500 yds
Eng: Allan W Lee

LEONARD, HARRY R
Wiseman
PLACER on Smith Cr Koyukuk dist, shovel-in, Au

LILLY, GEO & ASSOC
Fairbanks
PROSPECT, Kuguk Riv Fairhaven dist

LINDGREN, M & ASSOC
Fairbanks
PLACER, Coffe Dome & Bedrock Cr Fairbanks dist, Au

LINDQUIST HJALMER
Ophir
PLACER, Bedrock & Ester Cr, Innoko dist, Au

LITTLE MINOOK MNG CO
Fairbanks
Pres & Gen Mgr: Albin Martin
PLACER on Little Minook Cr, Rampart dist, dragline-hydraulic-dozer, Au, Ag
Prod: 600 yds

LIVENGOOD PLACERS
Livengood
Part: George Ramstad & C F Herbert
PLACER, Livengood Cr dragline, hydraulic

LONESOME MINE
c/o Cope Bros
LODE, Little Susitna Riv, Willow Cr dist, Au

LONG CREEK MNG CO
Ruby
Gen Mgr: Hans Tilleson
PLACER at Long Cr, Hydraulic-dozer-dragline, Au, Ag

LOST CHICKEN HILL MINES INC
2436 N Shore St, Chicago 45, Ill
c/o George Turner
PLACER, Lost Chicken Cr, Fortymile Dist, Au

LUCKY EIGHT MNG CO
Eagle
Own-Gen Mgr: Burnett F Hansen
Sec-Treas: Borghild Hansen
PLACER, Crooked Cr, Au
Asst Gen Mgr: Wallace T Brown

LUCKY NELL MINE
Hollis
Owner: J J Matuska
MINE, 7 mi W of Hollis, undergr, Au, Ag, Pb, Cu
Under devel
PUVALLUP MINE, 1 1/2 mi W of Hollis, undergr Au, Ag
Under devel
CASCADE MINE, 3 mi SW of Hollis, Undergr, Au, Ag
Under Devel

LUCKY SEVEN MINE
Miller House
Op: Walter Roman
PLACER, Mastedon Cr Circle dist, dozer-hydraulic, Au

LYNK CREEK MINE
P O Box 53, Tanana
Part: Lars Indegard,
Frank Cedgington
PLACER, tributary of Grant Creek, stripping
Under devel

MACLAREN RIVER COPPER
Box 4004, College
KATHLEEN-MARGARET COPPER MINE, College, undergr, Cu, Au, Ag
Under devel

MANSKE, DAN
Chicken
PLACER, Ingle Cr Fortymile dist, Au

MASCOT CREEK MNG CO
Fairbanks
PLACER, Mascot Cr, Fairbanks dist, Au

McCOMB, ROBERT
Chicken
MINE, S Fork Fortymile Riv, Fortymile dist

McMANN CORP
Nome
Op: Esch & Quisberg
PLACER, Kougarok Riv, Kougarok dist, Au

MIDNIGHT SUN MNG CO
Nome
PLACER, Shookum Cr Kougarok dist, Au

MINERALS RESEARCH
2 Marine Way, Juneau
Exploration Only

MINES VENTURES, INC
c/o Jack Moore, Gakona
PLACER, Middle Fork, Chistochina Riv Chistochina dist, Au

MISCOVICH BROTHERS
Poorman, Flat
Part: George Miscovich
John A Miscovich,
Howard Miscovich
Andrew Miscovich
PLACER, Poorman, Au
PLACER, Flat, Au
Prod: 300,000 to 500,000 cu yds yrly

MONETA PORCUPINE MINES, LTD
320 Bay Street, Toronto, Ontario, Canada
(Leasing Red Top Mercury Mines, Inc, Alaska)

MUMTRAK MINERS
Platinum
Pres & Gen Supt: James A Bystedt
VP: James Heverling
PLACER, 21 mi from Platinum, Au
Idle

NATIVE BISMUTH INC
Box 267, Nome
Pres & Gen Mgr: O A Margref
VP: D M Russell
CHARLEY CREEK BISMUTH MINE, 35 mi N of Nome undergr, Bi, Bi_2S_3 Au
Under devel

NESLAND & CO
Wiseman
PLACER, Vermont Cr, Koyukuk dist, Yukon Riv reg, dragline-dozer, Au

NEW YORK - ALASKA GOLD DREDGING CORP
1618 Smith Tower, Seattle, Wash
Pres & Man Dir: J K Crowdy
VP: G G C King
VP: Mark Mathewson
Sec: Leise G Robbins
Treas: Fannie Barley
Purch Agt: L E Robbins
NEW YORK - ALASKA MINE, 60 mi NE of Bethel, placer
3 dredges, dragline, Au
Res Mgr: Wm H Race
Asst Mgr: M F Bailey
Elec Eng: Clarence Clark

NO GRUB MNG CO
Box 3101 Eastchester Br,
Anchorage
Op: Ed Brenner
PLACER, No Grub Cr, Fairbanks dist, Au

NORTH AMERICAN DREDGE CO
Flat
Own: Alex Mathieson
PLACER, Flat, Iditarod dist, 2,500 yd bucketline, dredge, Au

NORTHERN LIGHTS MNG CO
Ruby
Op: Patrick Savage
Gen Mgr & Mech Eng: Michael Carroll
PLACER, Ruby dist, Au

NORTHERN MNG CO
Council
DREDGE, Niukluk Riv, Council dist, Au
(Operating Alaska Placer Co under lease and option)

NORTHERN TIN CO
911 American Building
Seattle 4, Wash
Pres: Harold Roslund
VP: Andrew O Olson
Sec & Mine Supt: George Ramstad
Treas: A W Ramstad
PLACER, (c/o Munz Airways, Nome) Buck Cr, 120 mi NW of Nome, Sn, Au
Idle

NUGGET CREEK MNG CO
Talkeetna
PLACER, Cache Cr, Yentna dist, Au

O'BRIEN, JIM & DUNSMUIR, JIM
Seward
PLACER, Surprise Cr Hope dist, Au

OGRIZ, JOHN & KOBLER, A
Flat
DREDGE, Otter Cr Iditarod dist Au

OLIVE CREEK MINES
Box 832, Fairbanks
Own-op: Carl Parker
PLACER on Olive Cr, 90 mi NW of Fairbanks dragline-dozer Au, Ag
Prod: 900 cu yds

OPHIR MNG CO
c/o Neal Beaton, Ophir
DREDGE, Upper Ganes Cr Innoko dist, Au
Idle

OSTNES, LARS & CO
Fortuna Ledge
Mgr: Lars Ostnes
PLACER on Willow Cr, Marshall dist, Yukon Riv reg, dragline-dozer-hydraulic, Au

OTTER DREDGING CO
Flat
DREDGE, Otter Cr, Iditarod dist, Au
Idle

P R & H MINING CO
Miller House
Part: F D Parker, J W Raymond, F O Hopkins
MASTADON CR PLACER, 118 mi N of Fairbanks, Au, Ag
Prod: 1,000 yds

PALMER & PIEHARS
Box 2528, Ketchikan
MINE, Nonitak Riv, Au
Under devel

PEKOVICH, W S
Box 629, Juneau
MINE, Port Snettisham, Juneau dist, Fe
Under devel

PETERSBURG EXPLORATIONS
c/o Dave Ohmer, Petersburg
MINE, SE Alaska, U_3O_8
Under devel

PIEPER & EICHNER
2450 Tongass, Ketchikan
PROSPECT, SE Alaska, U_3O_8

PILGRIM, EARL R & CO
Box 1896, Fairbanks
Own & Gen Mgr: Earl R Pilgrim
STAMPEDE MINE, Stampede, 110 mi SW of Fairbanks, undergr, Sb
40-TON GRAV MILL

PITTS, F H
Big Lake
LAKE CR PLACERS, Big Lake, hydraulic, Au Ag

POORMAN'S DREAM
Ketchikan
MINE, Kasaan Pen, Ketchikan dist
Under devel

PRICE, STAN
Windham Bay
PLACER, 1/4 mi from float head of deep water, hydraulic-dozer, Au, Zr

PRINCE CREEK MNG CO
Flat
Own: Harry Agoff
PLACER on Prince Cr, Iditarod dist, Yukon Rlv reg, hydraulic, Au

PRINCE MNG CO
216 Front St, Ketchikan
PROSPECT, SE Alaska, U_3O_8

PRINGLE, A W
Hot Springs
MINE on Rhode Island Cr, Dozer-hydraulic, Au

PRITCHETT, HEATH & TUCKER
2401 3rd Ave, Ketchikan
MINE, SE Alaska, U_3O_8
Under devel

PROSPECTORS, INC
544 2nd Ave, Fairbanks

PURDY, FRED & ARTHUR
Chicken
PLACER on Myers Fork, 40 mi dist, Yukon Rlv reg, dozer-hydraulic, Au

PURKEYPILE, I W
Box 572, Fairbanks
PLACER on Tommoran Cr, 30 mi W of Tanana, Sn, Au
Under devel

QUAIL CREEK MNG CO
Fairbanks
Co-Own: Willie H Rodig, M C Haugdahl
PLACER, Quail Cr, Rampart dist, Yukon Rlv reg, dozer-hydraulic, Au

QUEBEC METALL IND, LTD
c/o J Bonkowski, Box 40, Haines
PLACER & LODE, near Klukwan, Juneau dist, Fe
Under devel

RAINBOW MNG CO
Nome
Pres: Frank H Whaley
VP: Frank B Whaley
PLACER, 90 mi N of Nome, open pit, Au

RAMBAUD, JOHN
Chicken
PLACER, Napoleon Cr, Fortymile dist, Au

RED MT MNG CO
c/o A L Howard, Seattle, Wash
PLACER, McCann Cr, Goodnews Bay dist, Pt
Idle

RED TOP MERCURY MINES INC
Box 81, Dillingham
Pres: Clarence Wren
VP: Jim Pulvis
Sec-Treas: Harold J Butcher
Purch Agt: Clarence Wren
RED TOP MINE, 13 mi N of Dillingham, undergr, Hg
Under devel
(Leased to Moneta Porcupine Mines, Ltd, 320 Bay Street, Toronto, Ontario, Canada)

ROSANDER & REED
Ophir
Pres: T Rosander
PLACER, Yankee Cr, Innoko dist, hydraulic-dozer-dragline, Au

SAVAGE, PAT
Ruby
PLACER, Long Cr

SCHAEFER, RUSSEL B
Crooked Creek
CINNABAR CR PLACER, Kuskokwim Riv, Hg
Prod: 10 tons daily
10-TON MILL, at mine

SCHWAESDALL, ANDY
Fairbanks
PLACER on Myrtle Cr, Koyukuk dist, Yukon Riv reg, Au
Idle

SELDOVIA CHROME CO INC
Seldovia
Pres: John Little
VP: Dallas Newell
Sec: Frank Raby
MINE, Seldovia, open pit, Cr
Under devel

SLATE CREEK MNG CO
Fairbanks
PLACER, Slate Cr, Koyukuk dist, Au

SLATE CREEK PLACERS
408 7th St, Hamilton Acres, Fairbanks
Own: Hilliard Avend
PLACERS, Slate Cr, Rampart, Au
Idle

SLOCUM ARM MNG CO
Cobol via Juneau
LODE MINE, Cox-Bolyan Mine, Chichagof dist, Au
Under devel

SMITH, A D
Denali
HYDRAUL, Valdez Cr, Valdez Cr dist, Au
Idle

SMITH, LOREN & UTTER, DON
Palmer
PLACER, Eagle Cr, Chistochina dist, Au
Under devel

SOUTHEASTERN MNG & EXPLORATION CO, INC
c/o Faulkner, Benfield and Brochever, Juneau
Pres & Gen Mgr: Howard C Hayes
VP: Ray Mansfield
Sec: Joe Smith
Treas: Gordon Kanouse
LUCKY SIX MINE, Box 1135, Douglas, undergr, U_3O_8, Rare earths
Under devel

SQUAW CREEK MNG CO
Fairbanks
Op: Edwin C Gelvin
PLACER, Squaw Cr, Circle dist, Au

STANICH BROS
Fairbanks
PLACER, Porcupine Cr, Koyukuk dist, Au

STANTON, HAROLD
Talkeetna
PLACER on Thunder Cr, Yentna-Cache Cr dist, hydraulic, Au
Idle

STRANDBERG MINES, INC
926 4th Ave, Anchorage
PLACER, Colorado Cr, Innoko dist; Indian R, Hughes dist; Eureka Cr, Hot Springs dist, Au
LODE PROSPECT, Yentna dist, Au
NIXON FORK MINE, McGrath dist

STUVER, JULIAN
Flat
PLACER on Happy Cr, Iditarod dist, hydraulic, Au

SWANSON BROS
Haycock
PLACER, Dime & Bear Crs, Koyuk dist, Au
Idle

THUNDER MINES, INC
Anchorage
PROSPECT, Thunder Cr, Yentna dist, Au

TIGER TALISMAN PLACER
Box 294, Nome
Gen Mgr: J H Alexander
250-yd hydraulic-dozer, Au, Ag

TIMBERLINE PLACERS
c/o Spade & Stent, Miller House
PLACER, Porcupine Cr, Circle dist, Au

TWEET, H B & SONS
Teller
PLACER on Dahl Cr, Kougarok dist, hydraulic, Au

ULEN, E J
Wiseman
PLACER, Nolan Bench, Koyukuk dist, hydraulic, Au
Idle

UNION CARBIDE NUCLEAR CO
P O Box 716, Ketchikan
(Option and devel I & L Mng Co, Alaska)

U S SMELTING, REFINING & MNG CO
Box 1170, Fairbanks
VP & Gen Mgr, Alaskan Opr: J D Crawford
FAIRBANKS DEPT, 6 gold dredges at Fairbanks, 1 gold dredge at Chicken Cr
Mgr: J C Boswell
Supt, Thawing & Stripping: T A Loftus
Dredge Supt: W A LaFon
Cashier: L E Linck
Prod: 6,000,000 cu yds gravel
NOME DEPT, 2 gold dredges
Mgr: C S Glavinovich
Supt: W A Glavinovich
Cashier: Robert Baldwin
Prod: 18,000 yds gravel
(See Ariz, Mass, Utah)

U S STEEL CORP
525 William Penn Pl, Pittsburgh 30, Pa
EXPLOR, SE Alaska
(See Ala, Calif, Minn, Pa, Tenn Utah, Wyo)

U S TIN CORP
c/o W L Gibbon, 4th & Pike Bldg, Seattle, Wash
Chmn: H R Fischmaller
Sec: W L Gibbon
Treas: J J Gilmour
Gen Supt: Howard A Murray
LOST RIV TIN MINE, Lost Riv, 90 mi NW of Nome, undergr, placer dozer, Sn, WO_3
Idle

UOTILA & HARD
Ophir
Gen Mgr: Gus Uotila
OPHIR CR PLACER, Au

WACKWITZ, FRED
Box 1505, Fairbanks
PLACER, Bedrock Cr, Fairbanks dist, shovel-in, Au
LODE, head of Cleary Cr, Pb

WATSON, BEN
Yakutage
PLACER, Yakutage Beach, Yakutage dist, Au

WEINARD, FRED
Candle
PLACER, Jump Cr & Mud Cr, Fairhaven dist, Seward Penin reg, dragline-dozer, Au

WESTERN ALASKA MNG CO
Box 131, Spenard
Op: R J Andersen
MINE, Russian Mtns, Aniak dist, Hg

WHITE BEAR LODE CO
Ketchikan
Mgr: D Levy
Asst Mgr: A R Ferguson
LODE, Independence Cr, Fairhaven dist, Pb, Ag, Au
Idle

WILKINSON, ROBERT W
Miller House
PLACER, Miller Cr, Circle dist, Au

WOLF CREEK MNG CO
Box 141, Fairbanks
Pres: Andrew Anderson
VP: Geo Guttormsen
Gen Mgr: M Olson
PLACER, 30 mi N of Fairbanks, stripping over, Au

YOUNG, LARRY
Denali
PLACER, Dry Cr, Valdez Cr dist, Au

YUKON PLACERS, INC
Box 1160, Fairbanks
Pres: Charles P Herbert
Sec: A W Ramstad
Treas: Glen O Franklin
PLACER, Livengood, Au
Prod: 3,000 cu yds

ZAISER, CLARENCE
Ruby
PLACER on Greenstone Cr, drift, Au

ALABAMA

ALABAMA FLAKE GRAPHITE CO
320 Comer Bldg
Birmingham
Pres & Gen Mgr: W L Shumate, Jr
VP: W L Moore, S P McDonald
Sec-Treas: J F Berry Baugh
POCAHONTAS MINE, 4 1/2 mi W of Ashland, Ala, open pit, Crucible graphite, mica
Asst Gen Mgr: Joseph Sims
Gen Supt: W L Moore
Geol: H L Williams
Met: L B Adams
Under devel
500-TON FLOT MILL
Idle

AMERICAN TALC CO
Chatsworth, Ga
Pres: M Woodward Glenn
VP: Francis T Glenn
Sec: J R Perry
MINE, WINTERBORO, open pit, talc
Mine Supt: N R Davis
Prod: 100 tons
50-TON GRAV MILL, Alpine
Mill Supt: T E Davis
(See Ga)

ARRINGTON MNG CO
Cedartown, Ga
WASH PLANT, Glenwood, & Brundidge, Pike County, Fe

B & S MNG CO
Greenville
WASH PLANT, Butler County

BIBB MNG CO
Brundidge
WASH PLANT, near Brundidge

DIXIE MINES, INC
Box 365, Heflin
Pres & Treas: Ernest Kretschmar
VP & Purch Agt: Joe W Bailey
Sec: Robert Abbott
Adm Asst to Mgr: Eldridge Loudermilk
SHEFFNER MINE, Micaville, open pit, mica
Gen Mgr: Joe W Bailey
Geol: E C Van Horn
Mine Foreman: Glenn Gibson
MILL, wash, screen, tabling
Mill Foreman: Almond Hughes

GLENWOOD MNG CO, INC.
Glenwood
Pres: I D Gibson
VP: C B Gibson
Sec-Treas: D F Jackson, Sr.
GLENWOOD MINE, open pit, Fe
Gen Mgr: I D Gibson
Mine Supt: M G Cornett
Asst Mine Supt: Gene Arthur
Prod: 900 tons
MILL
Mill Supt: W D McLeod
Asst Mill Supt: H H Patton

GREENVILLE MNG CO
Greenville
WASH PLANT, Butler County

REPUBLIC STEEL CORP
Birmingham
EDWARDS MINE, Birmingham, undergr, Fe
Mgr: B H McCrackin
Supt: B C Jones
Elec Engr: J Donohue
Ch Engr: R B Watt
Maint Engr: E Read
Prod: 600,000 tons per year
SPAULDING MINE, Birmingham, underground, Fe
Supt: J G Blackwell
Foreman: P E Roy
Eng: George Jones
Prod: 1,000 tons
Prod: 400,000 tons per year
GRAV CONC
Prod: 400,000 tons per year
GRAV CONC
Prod: 250,000 tons per year
BLAST FURNACE, E Thomas, Ala
BLAST FURN & STEEL PLANT Gadsden
So Dist Mgr: E I Evans
(See Mich, Minn, NY, Ohio)

SHOOK & FLETCHER SUPPLY CO
1814 1st Ave N, Birmingham
Pres: P G Shook
VP: A M Shook, III
Sec-Cont: H G Thomas, Jr
Purch Eng: L M Quick
BLACKBURN & WARNER MINES, Russellville, surface, Fe
Gen Mgr: E H Craddock
ADKINS MINE, Woodstock, surface, Fe
Gen Mgr: H C Gunter
Prod: 2,500 tons

U S PIPE & FOUNDRY CO
3300 1st Ave N, Birmingham
Pres: C S Lawson
VP: Fred Osborne
Sec: J W Brennan

Asst Treas: W S Wilson
Purch Agt: H E Cross
Gen Supt: J W Nicol
Geol: Jack E Morris
Mng Eng: W E Hobson
Met: R H Stacey
Elec Eng: L E Shiffman
Safe Eng: J A Downey
RUSSELLVILLE MINE, 7 mi SE Russellville, surface, Fe
Supt: S A Britton
Asst Supt: Roy Shirley
Frm: Hobart Norton
H McAllister
Prod: 800 tons
HEAVY MEDIA MILL
Prod: 1,200 tons of limonite per day
BLAST FURNACES, Birmingham
Gen Supt: Dan Watkins
RUFFNER #2 MINE, Irondale, 7 mi E of Birmingham, undergr, Fe
Idle
SLOSS #2, Bessemer, 12 mi W of Birmingham, undergr, Fe
Supt: J W Russell
Asst Supt: P M Snow

U S STEEL CORP
TENNESSEE COAL & IRON DIVISION
PO Box 599, Fairfield
Pres: A V Wiebel
Exec VP: John Pugsley
VP-Oper: J W Kinnear, Jr
Mgr, Raw Mat: E P Reed
Ch Engr, Raw Mat: W S Springer
Purch Agt: L C Teague
IRON ORE MINES & COND PLANT, 6 undergr mines near Bessemer
Cap: 4,600,000 net tons crude iron ore per year
Gen Supt: A W Beck, Jr
Supt, #1 and 3 Mines: G M Neal
Supt #9, 10, 11 & 14 Mines: P J Zuhow
Supt, Ore Cond Plant: C E Lacy
(See Alaska, Calif, Mine, Pa, Tenn, Utah, Wyo)

WILSON, D M, BAUXITE CO
Eufaula

WILSON, R E, MNG CO
Eufaula
MINE & MILL, bauxite

WOODWARD IRON CO
Woodward
Pres: John E Urquhart
VP: W R Bond
Sec: D T Turnbull
Gen Supt: John Hager
Met: F U Leonard
Safe Eng: Stanley Mooney
Purch Agt: H K Stokes
PYNE MINE, 8 mi S of Bessemer, undergr, iron ore
Mine Supt: T W Davis
Asst Mine Supt: W H Thompson
Mine Engr: S E Sullivan
BLAST FURNACE, Woodward
Prod: 772,633 net tons per year
Supt: J B Casey
Asst Supt: C Y Huff

ARIZONA

ABE LINCOLN COPPER CO
Wickenburg
MINE, Maricopa Co, Cu

A C MNG CO
Yuma City
CACTUS JOHNSON MINE, Yuma City, undergr, Pb, Ag
Mgr, John J Rogers

JAMES D AKINS CO
1126 Petroleum Bldg, 714 W Olympic, Los Angeles 15, Calif
CONFUSION #1 MINE, Yuma County
Mn

AKREN MINES
2207 N 24th St, Phoenix
Pres: J A Akren
Gen Mgr: Fred Jenkins
PIONEER MINE, 20 mi E of Florence, undergr & surface Au, Ag, Cu, Pb
Idle

ALBA MNG CORP
Sanders
CHETO MINE, Apache Cty, surface, bentonite
Mgr: Spencer Balcomb, Jr

ALKEY MINE
Turnbaloose
Own: E B Escapule
Pb, Ag
Mgr: Jeff Humphrys
Idle

ALLEN, A D
Kingman
BORIANA LEASE, Mohave Cty, undergr, WO_3
Mgr: Blackie McGovern
Idle

ALTA URANIUM INC
10th & Grand, Grand Junction, Colo
Pres: R E Dorrart
VP: Tom Casto
Sec: O O Taylor
Treas: G R Simpson
GUANO CAVES MINE, San Simon, U_3O_8
Mine Supt: Wm Nelson

ALTUDA MINES, INC
P O Box 1743, Yuma
Pres: James V Spagon
Gen Mgr: Harry E Hamilton
VP & Asst Gen Mgr: Doyle C Gills
ALTUDA MINE, 25 mi SE of Gila Bend, undergr, Au, Ag
Idle

AMERICAN COPPER & URANIUM CORP
Globe
FOUR BAGGER MINE, Gila Cty, surface & undergr, Cu, Ag, U_3O_8
Mgr: L O Goodwin
Under devel

AMERICAN FIBER CORP
(SUBSID of HOLLY MINERALS CORP)
Drawer 2680, Globe
Pres: A H McRae
VP: E B Butts
ROCK HOUSE, ASBESTOS PEAK, & CHRYSOTILE MINES, Gila Co, undergr, asbestos
Gen Mgr: L E Town
Supt: S C Boucher & L Pear
Geol: Paul Meissner
Prod: 1 1/2 tons
MILL, Rock House mine, crushing & screening
Frm: M Reeve
Prod: 100 tons
MILL, Chrysotile mine
Frm: W Jenkins
Prod: 100 tons

AMERICAN SMELTING & REFINING CO
WESTERN MNG DEPT SW DIV
813 Valley Nat'l Bldg, Tucson
Mgr: T A Snedden
Ch Geol: Kenyon E Richard
TRENCH UNIT, Patagonia, undergr Pb, Ag, Zn
Supt: D R Jameson
100-TON FLOT MILL
HAYDEN PLANT, Hayden, 1200-ton smelt and conv, Cu
Supt: F J Downey
SW ORE PURCH OFFICE
810 Valley Nat'l Bldg, Tucson
Mgr: Reed F Welch
SILVER BELL MINE, Silver Bell, surface, Cu
Gen Supt: D R Purvis
Prod: 7,500 tons
MILL, Silver Bell, flot
(See Calif, Colo, Idaho, Ill, Kans, Mont, Nebr, N J, N Mex, N Y, Tex, Utah, Wash & Federal Mng & Smelting Co, Mo)

AMERICAN URANIUM CORP
217 Sixth St, S W
Albuquerque, N Mex
SCHOOL BOY & ASA CODY MINES, Navajo Indian Reservation, surface, U_3O_8, V
Gen Mgr: E T Chase
Gen Supt: Wm J Elam
Geol: Dale H Carlson
Asst Mine Supt: Asa Cody
Mine Eng: E T Chase
(See N Mex)

AMERICAN ZINC, LEAD & SMELTING CO
1515 Paul Brown Bldg, St Louis, Mo
HILLTOP MINE, Portal, undergr, Pb, Zn, Ag, Cu
Idle
(See Ill, Mo, Okla, Tenn, Tex, Wash)

ANCHA ASBESTOS CO
Box 1583, Globe
REYNOLDS FALL ASBESTOS MINE, U_3O_8
Under devel

ANNESLEY, GRIFFITH
211 Lumbermens Bldg, Portland, Oregon
U_3O_8 Prod

ARCO URANIUM
Jacobs Lake
ADDIE LUIS MINE, Coconino Cty, surface & undergr, U_3O_8
Mgr: Budge T Perritt

ARI - MICH MINES, INC
Box 708, Prescott
Pres & Gen Mgr: C W Gabrielson, Sr
VP: Harold Gates
Sec: Lynwood Webb
Gen Supt: C W Gabrielson, Jr
CATOCTIN MINE, 12 mi SW of Prescott, undergr, Ag, Au, Pb, Zn, Cu
Idle

ARIVACA MNG CO
1220 E Hampton St, Tucson
VOGEL MINE, Pima County, Pb, Zn
AMADO MINE, Pb, Ag
Mgr: T R Thomas

ARIZONA ASBESTOS MNG CO
c/o A H Dress, Box 823, Globe
STANSBURG MINE, asbestos
Idle

ARIZONA CONTINENTAL URANIUM, INC
Aztec Lodge, Young Rd, Globe
Pres: Willard Gidwitz
Sec: M H Braun
Treas: E E Yount
HOPE MINE, Young Rd, Globe, undergr, U_3O_8
Gen Mgr: Gerald Weathers
Mine Supt: F M McConochie
Under devel

ARIZONA COPPER MINES INC
Oracle
Pres: J E Morwinele
Gen Mgr: W R Shanklin
MINES, 20 mi N of Tucson, Cu
Supt: Louis Stickrodt
Idle

ARIZONA GIANT MNG CORP
220 E Birch Ave, Flagstaff
BLUE BONNETT 1-5 MINES, Coconino County, Cu

ARIZONA GOLCONDA METALS
Kingman
PEACH TUNNEL, Mohave County, undergr & surface, Pb, Zn
Mgr: Pat Ball
Idle

ARIZONA GYPSUM CORP
P O Box 6192, 2255 S 19th Ave, Phoenix
Pres: John F Fisher
VP, Gen Mgr, Mine Supt: James M Champie, Sr
Sec, Purch Agt: William J Kessler
Treas: John M Hazelett
ARIZONA GYPSUM MINE, Winkelman, open pit, gypsum
Asst Mine Supt: James M Champie, Jr
MILL, crush & screen

ARIZONA METALS CO
Box 1266, Kingman
Pres & Gen Mgr: R R Langley
SUMMIT ALPHA MINES, Au, Ag Cu, Pb, Zn
Idle

ARIZONA MINE, THE
Box 67, Humbolt
Gen Mgr: Verdin Alexander
ARIZONA MINE, THE, 2 1/2 mi W of Humbolt, Au, Ag, Pb, Zn
Idle

ARIZONA MINES CONSOL
Box 128, Casa Grande
STELLA MARIS #1, Pinal County, surface, Mn
Frm: Donald Wenger
(Leased from Don DeSilvia)

ARIZONA MNG CO
Box 3616, Tucson
VENTANA MINE, Pima County, Mn

ARIZONA MNG CORP
Box 152, Chloride
Sec: P H Lehrs, 17 John St, New York 38, NY
SAMOA GROUP, Mohave Co, Au, Ag, Pb, Zn, Cu
Idle

ARIZONA MNG & DEVEL CO
Payson
RATTLESNAKE MINE, Gila Cty, undergr & surface, Hg
Mgr: A B Griffith

ASHCROFT & FOUTZ
706 N Destin, Farmington, N Mex
U_3O_8 Prod

ASH PEAK LEASE
Box 208, Duncan
COMMERCE & SHAMROCK MINES, Ag
Idle

ASSOC MNG CO
Parker
Pres: A C Bureger
RIO VISTA, BILLY MACK, SUE, CAPILANO, MAMMON & LION HILL MINES, Cu, Au
Idle

ATHLETIC MNG CO
Box 791, Safford
Pres: Raymond F Orr
VP & Gen Mgr: Harvie L Horton
Sec: Ander K Orr
HEAD CENTER MINE, 12 mi NW of Klondyke, undergr, Zn, Pb, Cu, Ag, Au
Mine Supt: James Bryce
Mine Eng: A M Bosworth
Prod: 100 tons
PANAMA MINE, Zn, Pb, Ag
Mine Eng: A M Bosworth
Under devel
150-TON FLOT MILL, Klondyke
Mill Supt: Borden Burleson
Assay: Ervin Kuglendall

B & E MNG CO
Box 42, Tumacacori
Pres, Gen Mgr, Mine Eng: D D Burcher
VP: George Etz, Jr
BULL SPRINGS MINE, Josephine Canyon dist
undergr, Pb, Ag, Au, Cu
Mine Supt: F O Otero
Prod: 50 ton

B S & K MNG CO
Suite 307 1st Natl Bank Bldg, 411 N Central Ave, Phoenix
Pres & Gen Mgr: A M Kalaf
VP: George Kalaf
Sec-Treas, Purch Agt: Lee Newsom
ATLAS MINE, Box 18, Silverbell, 19 mi SW of Red Rock, undergr, Cu Zn
Geol: A M Rugg, Jr
Mine Frm: Walter Whitlow
125-TON FLOT MILL, 19 mi SW of Red Rock
Mill Frm: Milton Reeves

BAGDAD COPPER CORP
Bagdad
Pres: J C Lincoln
VP: Frank Snell
Sec: R H Jamison
Treas, Gen Mgr: G W Colville
Purch Agt: J W Schultheis
Ch Acct: M Thon
BAGDAD MINE, Bagdad, Surface, Cu, Mo, Ag
Asst Gen Mgr: R C Bogart
Mech Eng: C R Hammon
Met: E S Howell
Elect Eng: W D Deacon
Safety Eng: B J Henderson
Mine Supt: Olaf Hundrum
Mine Frm: D S Pike
Van Irwin
Prod: 3,500 tons
3,500-TON COPPER FLOT MILL, Bagdad
Supt: Gaylen Guest
Frm: A T Weatherhead, H P Mullins, D Van Tilberg
Assayer: D T Holmes

BALCONES CORP
403 E Travis St, San Antonio, Texas
DOG TOWN MINE, Pima County, undergr surface, Pb, Ag
Mgr: N C Vogel
Under devel
(Leased from Fred W Pickett, 80 N Church St, Tucson)

BANNER MNG CO
3042 Corner Stravenue, Tucson
Pres: E S Bowman
VP: A B Bowman
Sec-Treas: J E Hegle
MINERAL HILL MINE, Tucson, undergr, Cu, Ag
Gen Mgr: A B Bowman
Geol: Wallace Boyd
Mech Eng: E E Bray
Met: Paris Brough
Elec Eng: H Hodgers
Gen Mine Supt: B W Venable
Mine Supt: Wm Anderson, Jr
Mine Surv: Alton Young
Mine Frm: Wm Anderson
Night Frm: Paul Schapiro
Mine Eng: F D McKenzie
Prod: 550 tons
TWIN BUTTES MINE, Tucson
Gen Mgr: A B Bowman
Mech Eng: E E Bray
Met: Paris Brough
Elec Eng: H Hodgers
Mine Supt: B W Venable

Mine Frm: Gus Holzworth
Mine Eng: F D MacKenzie
Plan Eng: G E Jackson
Geol: Wallace Boyd
Mine Surv: Alton Young
Under devel
1,000-TON FLOT MILL, Mineral Hill mine
Supt: Frank Horton
Assayer: R G Miranda
(See N Mex)

BARTMUS, BROCK & DUKE
Kingman
Own: Peter Bartmus, Jr, Richard Brock, Stanley Duke, Earl Duke
SIXTY-THREE MINE, 15 mi from Kingman, undergr, Ag
Idle

BEE - SHO - SHEE MNG CO
c/o George Newitt,
Fruita, Colo
BEE-SHO-SHEE MINE, Apache City, undergr, surface, U_3O_8, V
Mgr: George Newitt

BEN HUR MNG CO
Klondyke Rural Station, Wilcox
BEN HUR MINE, Graham County, Pb, Zn

BIG BEAR MNG CO
c/o Otis Sholes, Elfrida
Pres: Otis Sholes
HIGHLAND MINE, Cochise County, Cr

BIG HOLE MNG CO
c/o Albert Adams, Box 128, Jerome
UNITED VERDE MINE, Yavapai, open pit, Cu

BIG HORN MNG CO
Box 1104, Wickenburg
BLACK ROCK MINE, Maricopa County, Mn

BIG SIX CO
Box 665, Eloy
Pres: Jim Brookbank
VP: Bill Stanfield
Sec: M Rosales
Treas: V A Cordell
Purch Agt: W A Knapton
Q U MINE, Globe
Idle

BLACK, W L
Box 1028, Globe
SO & SO MINE, 15 mi S of Globe, undergr, Ag, Pb
Under devel

BLACK CANYON COPPER CO INC
Box 1531, Phoenix
Pres: J W England, Jr
VP: Jerome Kaye
Sec-Treas: Ben Silverman
KAY COPPER MINE, Rocksprings, undergr, shaft, Cu, Zn, Au, Ag
Idle

BLACK DIAMOND
Yuma City
BLACK DIAMOND #2 MINE, Yuma City, surface & undergr, Mn
Mgr: P M Sturdevant

BLACK DRAGON
c/o W S Tolcott, Tucson
BLACK DRAGON MINE, Pima Cty, surface, Mn
Mgr: W S Tolcott
Idle

BLACK NUGGET MNG CORP
c/o Roy V Waughtel, Box 52, Aguila
Pres: Roy V Waughtel
BLACK NUGGET MINE, Maricopa County, Mn

BLACK OIL & MNG CO
Flagstaff
PEPPER POD & BURMA MINES, Coconino Cty, surface, U_3O_8
Mgr: W A Barbee

BLUE BONNETT #1-5
7th St, Cottonwood
Own: Hazel F Lockridge
MINES, Coconino Co, Ag, Cu
Idle

BLUEBONNET URANIUM CORP
Box 2360, Globe
Pres: Karl Grau
VP: Douglas Risinger
Treas: Ernest Garrett
COPPER CHIEF MINE, Stanley Butte, 50 mi E of Globe, undergr, Cu, Ag, Au, Ba
Gen Mgr & Mine Supt: Wm W Sorsen
Under devel

BLUEJAY, WEST COAST GOODLUCK & JUDGE MINES
Box 8, Cherry via Dewey
Own: Thomas Sutcliff & Robert Ayres
MINES, Yavapai Co, Cu
Idle

BOLICH, THOMAS
Mesa
WHETSTONE MINE, Pinal Cty, undergr, surface, Ag

BONANZA MNG CO
Prescott
GLADSTONE-MC CABE MINE, Yavapai County, Cu

BONHAM, G C
P O Box 45, Kanab, Utah
U_3O_8 Prod
Idle

BOSLEY MNG CO
312 W Dale, Flagstaff
Pres: Howard V Bosley
COPPER MT MINE, 15 mi W of Payson on E Verde Riv, undergr & open pit, Cu, Ag
Gen Mgr: Howard V Bosley
Gen Supt: R L Barry
Geol: A S Walters
Under devel

BOYD & FORTNER
P O Box 108,
Wickenburg
Part: Bert Boyd & B H Fortner
LUCKY MICA #1 MINE, 11 mi S of Wickenburg, undergr & open pit, spodumene, lepidolite
Idle
CLAIMS; UNITED EFFORT 1, 2 & 3, Cu, Au, Ag

BRACKEN, R J & F
Aguila
CROW MINE, Maricopa Cty, undergr, Mn
Mgr: R J Bracken
Idle

BRADLEY & ECKSTROM, INC
24 California St, San Francisco 11, Calif
MINES, variety of minerals
(See Calif, Idaho, Nev, Oreg, Utah)

BRASHEAR MNG CO
Morristown
MIDNIGHT OWL MINE, Maricopa Cty, surface, Li, colombittium berle
Mgr: P C Brashear

BUCKEYE MICA CO
Box 418, Buckeye
Pres & Gen Mgr: H G Smith, Sr
VP: H O Smith, Jr
Sec: W Francke
BUCKEYE GROUP, 3 1/2 mi S of Buckeye, undergr, Mica(Muscovite), Sericite, Be, Feldspar
Supt: A Duncan
Asst Supt: C Murphy
Frm: C V Hill
Prod: 100 tons
LUCKY CHANCE 1-2-3, 5 mi W of Quartzsite, Sericite
Prod: 25 tons
Under devel
100-TON DRY & WET GRINDING MILL.
Supt: J G Smith, Jr
Frm: Wayne Watts

BULL CANYON TUNGSTEN MINE
Box 48, Yucca
Idle

BURNEY MINES, INC
Box 5116, Tucson
Pres & Gen Mgr: R A Burney
VP: B H Martin
Sec-Treas: Lilia Burney
STOVE LID & AMPITHEATER MINES, 6 mi S of Oracle, undergr, Pb, Zn, Cu, Ag
Under devel
50-TON FLOT MILL, at Copper Rose claim

BY CHANCE MINE
c/o Col Frank Childs, Ajo
Op: Von R Calloway
MINE, Pima County, Ag, Cu

C & B MINE
2433 W Belmont Ave, Phoenix
Op: C F Moores
MINE, Gila County, Ag, Pb, Zn
Idle

C A R MINES, INC
Box 1052, Kingman
Pres: S H Reither
VP & Gen Mgr: A W Smith

DELA FOUNTAINE & COUPID MINES, 1 mi N of Kingman, undergr
Pb, Zn, Ag, Au, Cu
Idle

CALARI MNG CO
1939 Linden, Long Beach 7, Calif
Pres & Gen Mgr: L F Albrecht
Sec-Treas: C M Smith
Gen Supt: V H LeMay
RUTH MINE, Box 941, Prescott, 6 mi S of Prescott, undergr, Zn, Pb, Cu, Ag, Au
Under devel

CAMPBELL, GEO W & SON
Box 701, Salome
BLUE EAGLE CLAIMS, WO_3
Under devel

CAMPBELL, J A
Box 1145, Wickenburg
BIG SPAR, WEST END, JUMBO MINES, fluorspar
Under devel

CAPITOL URANIUM CO
P O Box 1847, Farmington, N Mex
Pres: Warren E Wiley
VP: Fred Carson
Sec-Treas: W A Pope, Jr
SIMPSON #1 MINE, Apache County, undergr, U_3O_8, V
Mine Supt: Marshall Fletcher
Prod: 30 tons

CARLOTA COPPER CO
530 W Latham, Phoenix
Pres & Gen Mgr: John L Alexander
CARLOTA MINE, 15 mi W of Miami, surface, Cu
Idle

CASH MINE
Prescott
Mgr: Jim Reynolds
MINE in Yavapai County, Au, Ag, Cu, Pb, Zn

CHANCE MNG CO
Box 137, Elfrida
SCHEERER MINE, Pb, Zn

CHARLESTON LEAD MINE CO
Box 347, Tombstone
CHARLESTON LEAD MINE, Pb, Zn

CHESSER & CO
Window Rock
URANIUM EXPLOR, Navajo Indian Reservation

CHILDS - OLDWINKLE MINE
711 E 6th St, Tucson
Own: I W Bonbright
Mgr: B H Martin
MINE, Cu, Mo
Under devel

CHILITO MINE GROUP
Box 1085, Hayden
Own: B C Velasco
Lessees: Wainwright & Murray
MINE, Gila County, Cu
Idle

CHRISTOFFERSON, HANS
Box 84, Aguila
MINE, undergr, Mn
Under devel

CIBOLA MLG CO
Phoenix
J P JR. MINE, Yuma Cty, Mn
Idle

CINDERRA MNG & ENGINEERING CO
308 Main St, Dallas, Texas
CINDERRA MILL, WO_3
Mgr: M F McKnight, Box 36, Sells

CLANI, THOMAS
Teec Nos Pos Tradingpost, Shiprock, New Mex
U_3O_8 Prod

CLIMAX URANIUM CORP
Box 1901, Grand Junction, Colo
VP & Gen Mgr: A R Mastrovich
URANIUM EXPLOR. & PROD, Navajo Indian Reservation
(See Colo, NY, Utah)

COBRE GRANDE MNG CO
P O Box 253, Safford
COBRE GRANDE MINE, Aravaipa Mng dist, Graham County, undergr, open pit, Cu, Au, Ag
Gen Mgr & Geol: Tom Beard
Asst Gen Mgr: Sam Neville
Gen Supt: Dan Hinton

COLBURN, E A JR
Box 152, Congress
CONGRESS MINE, 3 mi N of Congress Jct, undergr, Au, Ag, WO_3, U_3O_8
Under devel
(Leased to W A Murray, Box 152, Wickenburg)

CONSOL TUNGSTEN MINES, INC
Bagdad
Mgr: J M Cobb
MINE in Yavapai County, WO_3
Idle

COPPER BUTTE MNG CO
Box 668, Ray
COPPER BUTTE MINE, 7 mi W of Ray, surface, Cu
Mgr: C F Mitchell
Mech Eng: Filmore Heikkila
Prod: 400 tons monthly

COPPER CITIES DIV, MIAMI COPPER CO
Box 100, Miami
Purch Agt: R L Beals
MINE, 3 mi N of Miami, open pit, Cu
VP & Gen Mgr: R W Hughes
Mgr: B R Coil
Gen Supt: J H Gray
Geol: W W Simmons
Mech Eng: J J Lucheesa
Met: J J Bean
Elec Eng: T J Williams
Mine Supt: M M Stover
Prod: 12,000 tons
12,000-TON FLOT MILL, at mine
Mill Supt: T D Henderson
Assayer: G R Warren
Concen Supt: R L Mountjoy
(See NY)

COPPER CREEK COPPER CO
505 Title & Trust Bldg, Phoenix
OLD RELIABLE MINE, Pinal County, Cu

COPPER CROWN MINE
Kirkland
Gen Mgr: John L Solomon
MINE, 10 mi SE of Kirkland, undergr
Cu, Au, Ag, V
Under devel

COPPER HILL MNG CO
Box 388, Globe
Pres: T R Black, Box 46 Tipp City, Ohio
VP: T R Black, Jr
Purch Agt: L O Goodwall
SUPERIOR & BOSTON MINES, 4 mi NE of Globe, undergr, Mn, Cu
Idle

COPPER HILL SILICA
Globe
COPPER HILL SILICA PIT, Gila Cty, surface, Cu, Si
Mgr: E M Moores

COPPER MT MINE
172 S 3rd St, St George, Utah
Op: J E Wolfenstein
MINE, Mohave County, Cu
Idle

CORONADO COPPER & ZINC CO
1206 Pacific Mutual Bldg, Los Angeles 14, Calif
Pres: George D Dub
VP: Henry T Mudd
Sec: C W Six
Purch Agt: W F Stover
JOHNSON CAMP MINE, Box 44, Dragoon, 3 mi NW of Dragoon
Mine Mgr: Fred E Gray
Geol: R E Bergman
Met: L D Yundt
MOORE & REPUBLIC MINES, 6 mi N of Dragoon, undergr, Cu, Zn
200-TON FLOT MILL, Johnson Camp
(See Calif)

CORONADO DEVEL CO
Box 785, Farmington
COPPER REEF MINE, Graham County, Cu

CORONADO MINES, INC
RED MT, BUENA VISTA, GOLDEN ROSE & WASHINGTON MINES, Box 650, Nogales, undergr, Cu, Mo, WO_3, Pb, Au, Ag, pyrite
Idle

CORONATION MNG CO, INC
Box 387, Bouse
Pres & Gen Mgr: Charles Milton
VP: L A Linebaugh
Sec-Treas: H S Schneider
CORONATION MINES #1-74, Au, Ag, Cu
Idle

CRIPPLE CREEK MNG & MLG CO
Box 247, Cripple Creek
URANIUM EXPLOR, Navajo Indian Reservation
Under devel
(See Colo)

CROWN ASBESTOS MINES, INC
Box 1443, Globe
Pres: J E Talbot
VP & Gen Mgr: Fred W Kreider
Sec: Harry Ditmore
Geol: Arthur R Still
MINE, 35 mi NE of Globe, undergr, stripping, asbestos (chrysotile soft)
Supt: Fred W Kreider
Idle

CROWN POINT MNG CO
c/o G R French, 316 W Montebello Ave, Phoenix
Lessee: G R French
RAY SILVER LEAD MINE, Pb, Zn

CYPRUS MINES CORP
1206 Pacific Mutual Bldg, Los Angeles 14, Calif
OLD DECK MINE, Box 548, Bagdad, undergr, Zn, Cu
Gen Mgr: Paul W Allen
Res Mgr: Curtis Sundeen
Mine Supt: D P Turberville
Geol: Keith Cohe
Mech Eng: Herbert Dahlmon
Office Mgr: Walter Nelson
Mine Eng: Robert Bonnis
Prod: 1000 tons
Under devel
300-TON FLOT MILL, Bagdad
Mill Supt: Joseph Pimentel
(See Calif, Colo)

D & P MNG CO
1204 N Morris Ave, Tucson
FRIJOLI & TIP TOP MINES, Pima County, Cu

DASCO MINES CORP
Wenden
Pres & Purch Agt: Harrison Doyle
VP: Robert N Doyle
Sec & Treas: Robert Elsinger
DOYLE MINE, Wenden, open pit, Mn, Cu, Au
200-TON FLOT MILL, Wenden

DE GEER & ISBELL
Albuquerque, New Mexico
U_3O_8 Prod

R A DE LANO CO
6343 Babcock Ave, N Hollywood, Calif
MINERAL HILLS GROUP, Yuma County, Cu

DE LA OSSA, ALEX
Patagonia
KANSAS MINE, Pima Cty, surface, undergr, Cu, Pb, Zn

DE SILVIA, DON
515 E Willetta St, Phoenix
STELLA MARIS #1 MINE, Pinal County, surface, Mn
(Leased to Artic Mines Consol)

DETROIT MINE GROUP
Kingman
Own: I M George
Lessees: K N Hart & A Skinner
MINE, Mohave Co, Ag, Cu
Idle

DOYLE BROS
Aguila
DOYLE MINE, Yuma Cty, Surface, Mn
Mgr: Ted Lucero
Idle

DRAGOON ZINC MINE
Own: Flora C Hubbard, 1201 St Mary's Rd, Tucson, & Mrs W G Swart, 1712 High St, Alameda, Calif
MINE, Cochise County, Zn
Idle
(Leased to C B Higgins, Box 156, Benson)

DRAKE MNG CO
Black Canyon
KAY COPPER MINE, Yavapai, surface, undergr, Cu
Mgr: Kenneth Clark
Under devel

DUCOR MNG & MLG CO
Box 13, Prescott
POLAND MINE, Yavapai County, Au, Ag, Cu, Pb, Zn
Idle

DUNCAN, WALTER MNG CO
Box 1468, Cortez, Colo
Pres: J Walter Duncan, Jr
Gen Mgr: Charles R Butler
KESCO MINE, Lukachukai Mts, Apache Co, 23 mi SW of Shiprock, N Mex, undergr, U, V
Idle

DUTCH FLAT GROUP
Yucca
Own: Birt J Jackson
MINE, Mohave County undergr, WO_3, Au, Pb, Ag
Idle

DYE & BATHRICK A PARTNERSHIP
Box 1069, Kingman
Gen Mgr: R L Dye
Asst Gen Mgr: J H Bathrick
BORIANA MINE, Yucca, 18 mi NE of Yucca, dumps, WO_3, Cu, Ag
Prod: 150 tons
(Undergr leased to Bruce Atchinson, Kingman)
COPPER WORLD MINE, Yucca, Ag, Zn, Cu, Pb
Under devel
(Leased to Mi States Mng Co)

EAGLE - PICHER CO, THE MNG & SMELT DIV, WESTERN OPERATIONS
Box 231, Tucson
VP & Gen Mgr: O A Rockwell
Mgr: Grover J Duff
SAN XAVIER MINE, 20 mi S of Tucson, undergr, Pb, Zn, Cu
500-TON CONC ES

EL JAKARTA MNG CO LTD
Box 42, Tumacacori
Pres, Own & Gen Mgr: D D Bircher
A-B MINE, Josephine Canyon, undergr, Cu, Pb, Au Ag
Geol: E R Hill
Mine Supt: F O Otero
Mine Eng: D D Bircher
Under devel

EL TORO MNG CO
Box 705, Nogales
ROCK CANDY MT MINE, Santa Cruz County, Mn

EMERALD ISLE MINES
Box 174, Chloride
Op: C G Patterson
MINE, Chloride Cu

EMPEROR DUCHESS MINES CO, INC
Fairfield, Idaho
Pres: Ben Lasswell
VP: Chas Fuller
Sec-Treas: Roland Baldwin
Dir: Laurence Greea, Sells
MINE at Sells, Cu, Ag
Supt: M Green
Idle

ENDERS, ARTHUR
Box 341, Globe
WHITE TAIL ASBESTOS CLAIMS
Idle

ESPERANZA DUVAL COPPER MINE
Own: McGee Bros, Ruby Star Rt, Tucson & C D Wilson, Box 102, Sahuarita
MINE, Cu
Mgr: Ben G Messner 6061 E Ely, Tucson
Under devel
(Leased to Duval Sulphur & Potash Co, Box 11245, Tucson)

EVANS & EVANS
Aguila
NEEDLE EYE MINE, Mohave Cty, surface, Mn
Mgr: P T Evans
Under devel

EVERETT & RICHARDSON
Duncan
EUREKA #3 MINE, fluorspar
Idle

FIVE STAR MNG CO
P O Box 669, Enid, Oklahoma
U_3O_8 Prod

FOLEY BROTHERS
Minneapolis, Minn
URANIUM EXPLOR, Navajo Indian Reservation
Under devel

FONTAINE CUPEL MNG CORP
Box 1053, Kingman
DE LA FONTAINE MINE, Mohave County, Pb, Zn

FORTUNE MNG CO
Box 714, Nogales
ALTO MINE, Santa Cruz County, Pb, Zn, Cu, Ag
Under devel

FOSTER, L H
Box 614, Duncan
EUREKA MINE, Greelee Cty, fluorspar
Idle

FOUTZ, J L MNG CO
706 N Dustin, Farmington, N Mex
MITTEN & MONUMENT #1 MINE, Apache Cty, surface, undergr, U_3O_8
Mgr: J T Fraka

FRY, ANDREW A
P O Box 194, Shiprock, N Mex
U_3O_8 Prod

GAR PAC, INC
2419 S 5th St, Suite 11, Las Vegas, Nevada
Pres, Gen Mgr & Treas: Pace Foster
VP & Asst Gen Mgr: Garlin Davis
Sec: Stan Betty
Purch Agt: Ray Burgi
Office Mgr: Pat Foley
300 TON MAGNETIC SEPARATION MILL, Pinal County
Assayer: Joe Linn
(See N Mex)

GENERAL MINES LTD
Sahuarita
MINE, Pima County, Ag, Cu
Idle

GENERAL MNG CORP
8272 Sunset Blvd, Los Angeles, Calif
Pres: E J Speake
VP: Don Carty
Sec: Allan Thody
Treas: Howard Mallring
MINE, Yuma County, undergr & open pit, Mn
Prod: 20 tons

GIACOMA BROS
Box 546, Tombstone
Mgr: A P Giacoma
COSTELLO GROUP, Au
DEFIANCE MINE, Cochise Cty, undergr, surface, Pb, Zn

GIBRALTAR URANIUM & OIL CO
Box 352, Grand Junction, Colo
Pres: I W Andrews, Jr
ROUGH ROCK #1, Navajo Reservation, Chinle, undergr, U_3O_8, V
Gen Mgr: James I Geddes
Geol: Joe Bowman
Supt: James Martin
Prod: 30 tons

GILBERT, D C
Patagonia
ESTELLA MINE, Santa Cruz County, surface, undergr Cu, Pb, Zn

GILTED MNG CO
Aguila
Mgr: V D Standley
MINE in Maricopa County Mn

GLOBE MIAMI COPPER ZINC CORP
384 N 2nd Ave, Phoenix
Pres: John Evans
Sec-Treas: Russell A Wright
IRENE DOUGHBOY MINES
Globe 2 mi N of Globe, undergr, Mn
Gen Mgr: Russell A Wright
Geol: Fred Ramsing
Mine Supt: H C Smith
Idle

GLOBE TOLEDO MNG CO
528 Spitzer Bldg, Toledo, Ohio
GLOBE-TOLEDO MINE, Gila County, Cu

GLOBE URANIUM, INC
Globe
SUE MINE, Gila Cty, surface, undergr, U_3O_8
Mgr: W W Sorson
Idle

GOLDEN CROWN MNG CO
Box 95, Grand Canyon
Pres: Ralph G Brown
VP: David P Shirra
Sec: Berene Backus
ORPHAN LODE MINE, Grand Canyon, U_3O_8
Gen Supt: R V Wynne
Geol: Max E Kofford
Met: Jack K Howell
Consult Met: Alan Klasock
Consult Mng Eng: C Prior
Mine Supt: Pat Sayre
Mine Eng: Max E Kofford
ARIZONA-INDIANA, Tucson, Pb, Zn, Cu
Under devel
STODDARD, Mayer, Cu
Idle
CROWN KING, Crown King
Idle

GOLDEN GATE TRUST & MNG CO
Box 458, Wickenburg
Pres: N S Oberan
GOLDEN GATE & FRANKLIN D MINES, Yavapai County, Cu
Idle

GOLDFIELD MINES, INC
Mesa
Own: Hugh Nichols
Mgr: T H Russell
GOLDFIELD MINE, NE of Mesa, surface, Au
Idle
125-TON CYANIDE MILL
(Leased to Heizer & Landis)

GRACE MINES
Portal
Pres: M E Schad
GRACE MINES, Undergr, Zn, Pb,
Gen Supt: John L Schad
Under devel

GRAND CANYON URANIUM CO
c/o G C Beckham, P O Box 152, Kanab, Utah
U_3O_8 Prod
Idle

GRANNIS, FRANK & PATTERSON, C G
Chloride
ATWATER KENT GROUP, Zn, Pb
Idle

GRAY FOX TUNGSTEN
c/o E A Mitchell, Congress
Idle

GREEN STREAK MINE
Own: R L Fleming, Bouse
Op: L A Aplington
MINE, Yuma County, Au, Ag, Cu
Idle

GRIFFITH, BEN
Yucca
McCRACKEN MT GROUP, 67 mi SE of Kingman, undergr, Pb, Ag
Idle
60-TON GRAV FLOT MILL, Signal

GRISSOM MINES, INC
Box 1, Winkelman
Pres & Gen Mgr: Norman C Grissom
Sec-Treas: E L Grissom
70 MINE, undergr, Pb, Cu, Zn, Au, Ag
Under devel
50-TON GRAV-FLOT PILOT MILL, under constr at mine

GUNSITE BUTTE URANIUM CORP
26 W Broadway, Salt Lake Cty, Utah
Pres: Milton V Backman
VP: Claude Lacy
Sec: M J Florance
Treas: Nick Vrontikis
THOMAS #1, Marble Canyon, undergr, U_3O_8
Gen Mgr: L J Fyans
Eng: Ralph Karlsten
Idle

H & H MINING CO
Yucca
Gen Mgr: Earl Heath
MARY NEVADA MINE, undergr, Ag, Pb, Au
Prm: Sheldon Heath
Idle
40-YD GRAV OPR
Supt: Ray Farr

HAGEY, J H & J D
Box 205, Chloride
J & J CLAIMS, 10 mi E of Chloride, undergr, Au, Ag, Zn, Pb, Cu
Idle
D & H GROUP, 10 mi E of Chloride, Zn, Pb, Ag, Au, Cu, Mn
Idle

HANSFORD, LARRY
Quartzsite
BOWYER GAP MINE, Yuma Cty, surface, undergr, U_3O_8
Mgr: L L Farrington

HAPPY JEAN GROUP
Bouse
Op: George Bernardie
MINE, Yuma County, Au, Ag, Cu
Idle

HARBAUGH & CHINN
Box A, Tuba City
Gen Part: Kenneth H Harbaugh
Part: Howard A Chinn
JACKPOT #1-5-49, Cameron area, open pit, U_3O_8
Gen Supt: John Kleiner
Prod: 5 tons

HAYNES, V C
Box 795, Kingman
FLORESCENT MINE, WO_3

HENDERSON, MRS A S
Box 27, Patagonia
MINERAL MINE, 12 mi N of Patagonia, undergr, Pb, Zn, Ag Cu

Idle
(Leased to R G Moreno)
STAR #1, 2 T 3 MINES, 12 mi N of Patagonia, surface, Mn

HERALD MNG CORP
931 Simms Bldg, Albuquerque, N Mex
PURPLE PANSY, Maricopa County, open pit, Mn

HILTON, E P
Box 1308, Tucson
STATE OF MAINE & LONE MTN MINES, undergr, Pb, Ag, Au
Idle

HOLLY MINERALS CORP
(See SUBSID AMERICAN FIBER CORP)

HOLMESTAKE MNG CO
Box 308, Winterhaven, Calif
SONORA GROUP, Yuma County, Pb, Ag
(See Calif)

HOLY CROSS MINE
1302 Casa Grande Rd, Tucson
Op: Tom D Callan, Oracle
MINE, Pinal County, Ag, Cu
Idle

HOOPES & CO
Globe
Mgr: N L Hoopes
MINE, MILL in Gila County, limestone

HOPE MNG & MLG CO
Phoenix
HIGHLAND MAIN CLAIMS, Cochise County, surface, undergr, Cu
MUSSO MINE, Cu
Op: Odell Still
(Leased to Odell Still, Box 208, Elfrida)

HOWARD MNG CO
Bouse
JACKY #1 & 2 MINES, Yuma County, Cu

HOYT, PHILLIP S & SON
P O Box 2040, 543 E Culver, Phoenix
Own: Philip S Hoyt, Sr & Philip S Hoyt, Jr
MICA MINES, Mohave, Maricopa, Yuma County, undergr & surface, mica, rare earths
Under devel

HUMBOLDT COPPER MINE
Dewey
LAURA SHAFT, Yavapai Cty, undergr, surface, Cu
Mgr: Harry L Dobler

HUNTLEY INDUSTRIAL MIN, INC
Box 305, Bishop, Calif
Treas: L G Hummel
MERLO MICA MINE, Kingman
Idle
(See Calif)

INDIAN SPRINGS MINE
Box 1005, Globe
Gen Mgr: H R Scott
Sec: R D Mich
Geol: William A Scott
Purch Agt: H R Scott
MINE, 14 mi S of Globe, undergr, asbestos
Idle

INSPIRATION CONS COPPER CO
25 Broadway, New York 4, N Y
Pres: R S Newlin
VP & Sec: H M Jacob
Treas & Asst Sec: E P Wendt
Dir of Purch: A B Harris
INSPIRATION MINE, Inspiration, surface, Cu
VP & Gen Mgr: P D L Honeyman
Asst Gen Mgr: H C Weed
Asst Sec & Asst Treas: C G Stone
Plant Supt: C B Kettering
Geol: E P Reed
Mech Eng: A H Neal
Met: P M Musgrove
Elec Eng: Mark Smith
Auditor: E M Bredwell
Purch Agt: E P Dolin
Power Pl Supt: T E Tizard
Mine Supt: J N Watts
Asst Mine Supt: T E Bilson
Open Pit Prm: T M Anderson
Div Supt: R G Thomson
Ch Mng Eng: J L Carne
Prod: 16,000 tons
CHRISTMAS MINE, Christmas, undergr, Cu
Gen Supt: B B Whitney
Mine Supt: N G Thomson
Mine Frm: M R Plain
Geol: J T Eastlick
Under devel
LEACHING PLANT AND CONC, Inspiration
Plant Supt: C B Kettering
Plant Frm: W D Schrader
Acid Plant Frm: W H Parker
Conc Supt: K L Power
Conc Frm: S E McNeil

INTERNATIONAL MINERALS & CHEM CORP
CONS FELDSPAR DEPT
20 N Wacker Dr, Chicago 6, Ill
Pres: Louis Ware
VP: Norman J Dunbeck
Mgr: E W Koenig
Asst Mgr: Phil Blasovic, Jr
FELDSPAR MINE, Box 220, Kingman, surface
Supt: J D Howell
Prod: 50 tons
150-TON MILL, E Kingman, fine grinding
Supt: J D Howell
(See Colo, Fla, Ill, Maine, Miss, N Mex, N C, Ohio, Tenn, Va)

INTERNATL ORE CORP
Wickenburg
MINE, Maricopa Cty, surface, Hg
Mgr: D P Simpson

INTERNATL SMELTING & REFINING CO
Miami
3,000-TON CUSTOM SMELTER, Inspiration
Supt: Harold Foard
Ore Buyer: Clifton F Smith

INTERSTATE MNG & EXPLOR CORP
1030 1st Nat'l Bank Bldg, Denver 2, Colo
Pres: S R Mahoney
VP & Treas: L H Seagrave
Sec: W G Dillon
VP: B C Heath
PROSPECT MINE, undergr, U_3O_8
Gen Mgr: G C Rideau
Under devel
(See Colo, Nev)

IRON GAP URANIUM CORP
Tempe
IRON GAP MINE, Gila Cty, Surface, U_3O_8, Cu
Mgr: B H Martin
Idle

ISBELL - DEGEER
c/o Ted Paddock, Shiprock, N Mex
RUEBEN LEE MINE, Apache Cty, undergr, U_3O_8, V

JACKSON, E M
Dragoon
GOLDEN RULE MINE, Box 346, Benson
undergr, Au, Ag, Pb

JACOBS LAKE MNG CO
Jacobs Lake,
PETOSKEY GROUP, Coconino County, Cu

JAQUAYS MNG CORP
1319 S 19th Ave, Phoenix
Pres & Gen Mgr: D W Jaquays
VP: G A Jaquays
Sec-Treas: Ethelyn Jaquays
Gen-Mgr: Alvin Gerhardt
Gen Supt: Leroy Wood
REGAL MINE, Box 328, Globe, 47 mi N of Globe, undergr, asbestos
Mine Supt: F H Padgett
Prod: 50 tons
15-TON GRAV MILL, Globe
Mill Supt: C C Corley

JOHNNIE BELL MNG CO
Globe
JOHNNIE BELL MINE, Gila Cty, surface, Mn
Mgr: Johnnie Dubor
Idle

JOHNSON MNG CO
55 N Matlock St, Mesa
Mgr: A H Johnson
RARE METALS MOLY MINE & BLACK COPPER GROUP, 4 mi S of Kelvin, undergr, Cu, Au, Ag, Mo U_3O_8
Idle

K B R MNG & DEVEL CORP, INC
Box 196, Yarnell
Pres & Purch Agt: Jerold P Kolar
Sec: P A Brittain
Treas: Elsie Kolar
STAR OF ARIZONA, ELSIE'S JACK POT #1 & #2 MINES, Kolar Group, undergr, Au, Ag, Cu, Pb
Gen Mgr: C A Brittain
Under devel

KACHINA URANIUM CORP
276 S W Temple, Salt Lake City, Utah
Pres & Gen Mgr: Carl C Adair
VP: Geo R Adair
Sec: Verl W Adair
JEEPSTER #1 & KACHINA #8 MINES, 5 mi N of Cameron, Ariz, open pit, U_3O_8, Cu
Geol & Mine Supt: Mason W Rankin
Prod: 40 tons
LAGUNA MINE, in Laguna Valley on the Hualapai Indian Reservation, 35 mi N of Peach Springs, Ariz, open pit, Cu
Gen Mgr: Mason W Rankin
Mine Supt: William Ellis
Prod: 40 tons

KENNECOTT COPPER CORP, RAY MINES DIV
Ray
Gen Mgr: A P Morris
Asst Gen Mgr: H J O'Carroll
Compt: C R Knous
Purch Agt: N E Guyer
Adm Asst: C L Hoyt
Ind Eng: A T Shukas
RAY MINES, open pit, Cu, Ag
Mine Supt: J C Van DeWater
Asst Pit Supt: R W Ballmer
Ind & Labor Rel Dir: J E Peterson
Asst Mech Supt: A L Dickerson
Pit Frm: W Taylor
Ch Eng: H W Bishop
Ch Elect: L J Miller
Prod: 16,000 tons
16,000 - TON FLOT MILL, Hayden, 23 mi SE of Ray
Supt: J L Stevens
Asst Supt: G P Sewell
Master Mech: P M Hoskin
Met Eng: D V Galbiati
Plant Eng: R C Johnson
Ch Elect: C C Fanning
(See Nev, N Mex, NY, Utah)

KERR - McGEE OIL INDUST, INC
NAVAJO URANIUM DIV
Box 608, Shiprock, New Mex
COVE MINE, Cove, undergr, U_3O_8, V_2O_5
Mgr: V L Mattson
Geol: Billy Stevens
Mine Supt: Jack Landon
Mine Frm: Vernon Willden
MILL, Shiprock, N Mex
(See New Mex, Wyo)

KING SOLOMONS MNG CO
Wickenburg
KING SOLOMONS MINE, Yavapai Cty, surface, undergr, U_3O_8
Mgr: Don Platt

KINSEY, T C
Mammoth
CRESCENT MINE, Pinal Cty, surface, Mn
Mgr: C C Burnham
Idle

KNIGHT, SAM, MINING LEASE, INC
Tucson
BONANZA MINE, Santa Cruz County, surface, undergr, Cu, Ag
Mgr, Frank Knight

KNOX - ARIZONA COPPER MNG CORP
8967 Ladue Rd, St Louis 24, Mo
Pres: Wm A Knox
VP: Tom Keyes
Sec-Treas: Wm A Knox
COPPER MT MINE, Ajo
Geol: Edward Clark

KYLE ASBESTOS MINES OF ARIZ
Box 302, Globe
Op: Roger Q Kyle

L B D M MNG CO
3841 N Park Ave, Tucson
COLUMBIA MINE, Pima County, Mn

LA GOLONDRINA MINE
Dragoon, open pit, Cu, Pb, U_3O_8, V_2O_5, Mo
Co-Own: M V Lee
Idle

LA SALLE MNG CO
P O Box 217, Grand Junction, Colo
U_3O_8 Prod

LEAD KING MINES, INC
701 S 8th St, Las Vegas, Nevada
Pres & Gen Mgr: Eugene G Moyne
VP: Frank LaGrange
Sec: William B Byrne
RUTH & RATTAN MINES, San Francisco Mag dist, Mohave County, undergr, Au
Idle

LEAD & ZINC CORP OF AMER
Box 606, Globe
Pres: Grady B Gulledge
VP: J B Williamson
Gen Mgr: Ray Pointer
BEN HUR MINE, 15 mi NW of Klondyke, undergr, Pb, Zn, Cu, Ag
Idle

LEON, MILTON
206 Wright Bldg, Tulsa 3, Okla
UNCLE SAM MINE, Box 650, Nogales, 5 mi NE of Nogales, undergr, Au, Ag, Pb
Under devel

LEROY MINE
Cochise Cty
MINE, Cochise Cty, undergr & surface, Pb, Ag
Mgr: Gwide Bloome, Manhattan Beach, Calif

LEWISOHN COPPER CORP
120 N Church, Tucson
Pres & Treas: Richard E Chilson
VP: Boyd M Morse
PEACH MINE, Helvetia, 26 mi S E of Tucson in Santa Rita Mts, open pit, Cu
Gen Mgr: Don Martin
Geol: Arthur Heyman
Met: Howard Hendricks
Mine Frm: David DeMoss
Under devel
KING MINE, Helvetia, undergr, Cu

LIEBERMAN ENTERPRISES, INC
650 S 4th Ave, Tucson
Pres: Don Lieberman
GOOD ENOUGH MINE, Los Guijas Mng dist, 10 mi N of Arivaca, undergr, WO_3
Idle
50-TON GRAV MILL
Idle

LONE STAR MINES, INC
702 10th Ave, Safford
Pres: J P Merrill
VP: Albert Spalding
Sec: Paul Merrill
LONE STAR MINE, 10 mi NE of Safford, undergr
Under devel

LONE STAR URANIUM DRILLING CO, INC
c/o A R Bedwell, Farmington, N Mex
MINE, Apache Cty, undergr, surface, U_3O_8, V

LOVE, S J
Wickenburg & Wenden
LOVE MINE & EXTENSION, Mohave Cty, surface, Mn
Mgr: Bob Monahon
Jack Vaughn

LUCKY MNG CO
Box 1662, Parker
LUCKY MINE, Yuma County, Cu

LUCKY STOP MNG CO
Young Rt, Globe
Partnership: Johnnie Brunson
William Brunson
Ed Conway
Hugh Nichols
LUCKY STOP MINE, Gila Cty, undergr, U_3O_8
Mgr & Mine Supt: Johnnie Brunson
Prod: 15 tons

LUCKY SWEDE MNG CLAIM
Box 2231, Warren
Own: George Erickson
CLAIM, 6 mi E of Lowell, undergr, Idle

M & S COPPER CO
Box J, Casa Grande
REWARD MINE, Pinal County, Pb, Zn

MAGIC MINE
Wenden
Au
Oprs: E J Johnson, T E Warren
Idle

MAGMA COPPER CO
Box 37, Superior
Pres & Gen Mgr: W P Goss
Asst: P G Sarver
Asst Gen Mgr: J F Buchanan
VP & Sec: Roy Bonebrake
Treas: W P Schmid
Purch Agt: Ray Medlock
Asst: W J Swanson
MAGMA MINE, Superior, undergr, Cu, Ag, Au
Gen Mgr: C B Forsher
Asst Gen Mgr: Darrell Gardner
Geol: R N Webster
Mech Eng: Howard Johnston

Elec Eng: T P Trask
Supt: G L Augestadt
Frm: M C Cooksley
Eng: B Van Voorhis
Prod: 1, 500 tons
1, 500-TON FLOT MILL, Superior
Supt: Halder Rex
Frm: Ernest G Green
Assay: Martin Harris
REVERB SMELTER, Superior
Supt: E J Caldwell
Asst Supt: C L Senio
Prod: 48, 000, 000 lbs per year

MAGMA KING MANGANESE MINE
Superior
MINE in Pinal County, Mn, Ag
Mgr: Ralph Pomeroy
Idle

MAGOR MNG CO
Shiprock, N Mex
U_3O_8 Prod

MANGANESE KING MNG SYN
Box 335, Bouse
Pres: R N Doyle
VP & Sec: Harrison Doyle
Gen Mgr: L A Aplington
MANGANESE KING MINE, 36 mi NE of Bouse, surface

MANHATTAN CONSOL MINES DEV CO
Box 351, Tonopah, Nevada
Pres: J Fred McCulloch
Sec: Nick J Barbarich
SCRIBNER MINE, Box 108, Elfrida, 25 mi NW of Elfrida, undergr, Pb, Ag, Au
Idle

MARBLE MNG CO
587 11th Ave, Salt Lake City, Utah
U_3O_8 Prod

MARCY EXPLORATION & MNG CO, INC
1001 1/2 N Main Ave, Durango, Colo
Pres & Gen Mgr: S Stokes Tomlin, Jr
VP & Geol: E M Barge
Sec: R M Schell
Treas: Robert R Snodgrass
JACK DANIELS MINE, Cameron, open pit, U_3O_8, V_2O_5
Mine Supt: G R Green
Asst Mine Supt: P E Posnjoc
Prod: 70 tons
(See Utah)

MASSINGALE, LON
Casa Grande
SILVER REEF, #7 MINE, Pinal City, undergr, Pb, Ag, Cu
Mgr: Lee Bulso

McELRATH, FRANK
Agulla
ROADSIDE MINE, Maricopa Cty, surface, Mn
Mgr: Clifford GoForth

McFARLAND, E W
Nogales
HOLLAND MINE, Santa Cruz County, surface, undergr, Cu, Pb, Zn

McFARLAND & HULLINGER
Bazaba
SAN XAVIER MINE, Pima Cty, surface, undergr, Pb
Mgr: W D Nelson

McVAY MNG & MILL CO
Wenden
THREE MUSKETEERS MINE, Yuma Cty, surface, undergr, WO_3
Mgr: Harvey Moore

MELLINGER, PORT B
Box 247, North Lima, Ohio
MT SPRING MINE, Bagdad, undergr, Pb, Zn, Ag, Au, Cu
Under devel

METATE ASBESTOS CORP
Box 11, Globe
Pres: Charles Robert Neal
VP & Gen Mgr: Jack L Neal
Asst Sec: Charles Ross Neal
Treas: R C McNabb
APACHE MINE, Box 1566, Globe
18 mi NE of Globe, undergr, asbestos
Prod: 5 tons
Mine Supt: Richard Eddy
MILL, 8 tons cobbed ore per day
Mill Supt: Charles Ross Neal
CHIRICAHUA GROUP, San Carlos, Apache Reservation, asbestos
Supt: Jack L Neal

MEX AIR URANIUM CO
Gen Del, Monticello, Utah
U_3O_8 Prod

MIAMI COPPER CO
Box 180, Miami
Purch Agt: R L Beals
Gen Mgr: Benjamin R Coll
Asst Mgr: J B Gray
Gen Supt: C C Webb
Geol: W W Simmons
Mech Eng: J J Lucheese
Met: J J Bean
Elec Eng: A T Netterblad
Concen Sup: R L Montjoy
MIAMI MINE, Miami, undergr Cu, Mo,
Mine Supt: E G Williams
Asst Supt: W F Sloan
Frm: J B Garner
Eng: J B Fletcher
Prod: 12, 000 tons
12, 000 -TON FLOT MILL
Mill Supt: Ray Ashmore
Assay: G W Warren
(See NY and Copper Cities Div, Ariz)

MIDNIGHT & MIDNIGHT EXT #1 MINES
Box 1022, Nogales
Own: Val & Margaret Cason
MINES, Santa Cruz County, Ag, Pb
Idle

MILLER - CHRISTOFFERSON
Agulla
BLACK QUEEN MINE, Maricopa Cty, surface, Mn
Mgr: Milton Miller

MINERAL MT M & M CO
330 E 14th St, Tempe
Pres: C M Miller
VP & Gen Mgr: L L Boyer
GORHAM-HALL GROUP, 20 mi SW of Superior, Pb, Ag, Zn, undergr
WOODPECKER MINE, Pinal County, Au, Ag, Pb
Under devel
SILVER QUEEN GROUP, 23 mi SW of Superior, Pb, Ag
Idle

MINES CONTRACTING, INC
507 E Willetta St, Phoenix
(See Calif)

MOHAVE MNG & MLG CO
Box 1506, Wickenburg
Pres: H F Lyon
VP: G S Borden
Sec & Treas: Frank Kohler
Purch Agt: Jack Evans
Mgr: W R Easley
BOK GARDEN MINE, near Wickenburg, open pit, Mn
mining by contract
Geol: Earl Whitney
Met: Robert Kidd
Prod: 200 tons
600-TON HEAV-MED MILL, tables
Artillery Peak
Mill Supt: Robert Platt
Mill Frm: Harry Bevington
Assayer: Joe Girard
1, 000-TON FLOT & HEAV-MED MILL, tables, Wickenburg
Mill Supt: Tom Saunders
Assayer: Don Woodall
Supt: Bob Monahan
SINTERING PLANT, Wickenburg

MONICA GROUP
Box 27, Yarnell
Own: C D Howe, John L Riggins, L J Jaycox
MINE, Yavapai County, Au

MONITOR GROUP
Lessee: G R French
Mgr: Chas F Moore, Box 691, Globe
MINE, Pinal County, Au, Ag, Cu, Pb

MONTANA - ARIZONA MNG CO
Box 16, Lakeville
Mgr: Charles R Anderson
JEFF MILTON OR VERDE MINE, Cu

MONTE CRISTO
Wickenburg
MONTE CRISTO MINE, Yavapai County, surface, undergr, Ag, Cu
Mgr: E B Ashurst

MORROW MNG ASSOC
Wickenburg
JUMBO MINE, Maricopa Cty, surface, Li
Mgr: Robert Pinkerton

MT STATES METALS CO
Tucca
Pres & Gen Mgr: G A Freeman
COPPER WORLD MINE, 15 mi NE of Tucca, undergr, Cu, Zn
Idle
COPPER WORLD MILL

MT STATES URANIUM CO
1305 Kennedy, Grand Junction, Colo
Pres: A K Wilson, Jr
SAN JUAN MINE, WO_3
Supt: Claude Boyd

NACHENBETAH, FRANK
110 N Orchard Ave, Farmington, N Mex
U_3O_8 Prod

NASH MINES
406 Nash Bldg, Austin, Tex
Own: Jos P Nash
BONANZA, HOLLAND, KANSAS, ESTELLA, BELMONT, MAINE, NEW YORK, INDIANA, DUQUESNE, & EMPIRE MINES, Patagonia Mng dist
Gen Mgr: D C Gilbert

NAVAJO TRIBE
Window Rock
NAVAJO RESERVATION, undergr & surface, U_3O_8

NEW PIEDMONT MINES
1640 Los Pomaritas Dr, Phoenix
NEW PIEDMONT #1 MINE, Yavapai County, Cu

NUKAL MNG CO
Superior
NUKAL MINE, Pinal Cty, surface, undergr, Mn
Mgr: Clarence Venzetti
Idle

OAK CREEK MNG CO
Phoenix
OAK CREEK MINE, Gila Cty, surface, undergr, U_3O_8
Mgr: L E H Huber

OLD DOMINION GREY GROUP
Box 100, Miami
Own: Miami Copper Co
MINE, Gila County, Cu
Idle

OLD GOLD MNG CO
Box 268, Selis
Own & Op: Maurice Hedderman
ALLISON MINE, Selis, undergr, Au, Si, Ag
Prod: 20 tons

OLD HICKORY COPPER CO
324 N 2nd Ave, Phoenix
Pres: Russell A Wright
LISTA BLUNCA MINE, Caborca, Son, Mexico, undergr, Cu, Ag, Au
Gen Mgr: Robert Dannelley
Asst Gen Mgr: A E Moorhouse
Geol: F C Ramsing
Idle

ORO BLANCO MINES
Box 66, Ruby Star Rt, Tucson
Gen Mgr: T J Anderson
ORO BLANCO MINE, 75 mi S of Tucson, undergr, Au, Ag
30-TON GRAV MILL, Santa Cruz County
Idle

ORO FINO MINES, INC
Box 701, Prescott
Pres & Gen Mgr: C W Gabrielson
VP & Sec: Newell Newton
ORO FINO MINES nr Wilhoit, placer Au
Under devel

ORO FLAME MNG CO
202 N Pleasant St, Prescott
Mgr: Elmer Snell
ORO FLAME & OHIO MINES, Yavapai County, undergr, Au, Ag, Pb
Idle

ORR, JACK
Rt 1, Box 396, Prescott
CASH MINE, 12 mi S of Prescott, Au, Ag, Cu, Pb, Zn
Idle
SENATOR GROUP, Yavapai County, Ag, Cu
(Leased from Phelps Dodge Corp)
Idle

OSBORNE, HARRY M
Box 1017, Parker
SUE MINE, undergr, Au, Cu
Y-TON MILL
Idle

PAN - AM MNG CO, INC
Panhandle, Texas
Pres & Gen Mgr: Clarence C Williams
VP: C E Lyles
Sec: E G Stapp
Treas: Cyril Pingleton
STARLIGHT MINE, 26 mi SE of Globe, Ariz, undergr, Cu, Ba, Pb
Gen Supt: Grady Stapp
Geol: Dick N Campbell
Mine Frm: E B Richardson
Under devel

PARIA RIV URANIUM CO
Marble Canyon Lodge
c/o Phillip N McCrary, Mgr
MOQUI GROUP, Coconino Cty, surface, U_3O_8

PATTERSON, C G
Wenden
BLACK DIAMOND EXTENSION, Mohave Cty, undergr, surface, Mn
Mgr: Albert Schull

PAUL LIME PLANT
Paul Spur
Pres & Gen Mgr: Alfred Paul, Jr
Asst Mgr: Lester O Goddard
Purch Agt: Howard Ames, Jr
MINE, open pit, lime rock
Gen Supt: Tom Bishop
Prod: 500 tons
LIME KILNS, rotary kilns, crushing & grinding and screening plant

PERLITE INDUSTRIES OF ARIZONA
2133 E Henshaw Rd, Phoenix
Pres: Lewis Williams
VP: Reagan Williams
Sec-Treas: Buster Williams
PERLITE INDUSTRIES MINE, Superior, open pit, perlite
Gen Mgr: Buster Williams
Supt: Harley Miller
Prod: 50 tons
MILL, Superior, crushing
Supt: Harley Miller

PETTIGREW & DAVIS
Dove Creek, Colo
U_3O_8 Prod

PETTIGREW, WORLEY, REYNOLDS
c/o John Worley, Shiprock, N Mex
WEST MESA MINE, Apache Cty, surface, undergr, U_3O_8

PHELPS DODGE CORP WESTERN OPERATIONS
Douglas
WESTERN GEN OFFICES
VP, Western Oper: C R Russell
Gen Mgr, Western Oper: W C Lawson
Asst Gen Mgr: J B Pullen
Office Mgr: H E Moore
Dir, Labor Rel: W J Uren
Asst Chief Eng: J H Davis, Jr
Geophys Research: E E Maillot
Gen Aud: John Kuhn
Asst Gen Purch Agt: K A Ahlen
West Traffic Agt: A C Bacon
MORENCI BRANCH, Morenci open pit Mines, Cu, Au, Ag, Mo concentrator & smelter
Mgr: L M Barker
Gen Supt: W B Fessi
NEW CORNELIA BRANCH, Ajo open pit Mines, Cu, Au, Ag concentrator & smelter
Mgr: A T Barr
Gen Supt: J A Lentz
COPPER QUEEN BRANCH, Bisbee, undergr & open pit Mines, Cu, Au, Ag, concentrator
Mgr: C E Mills
Mine Supt: W W Little
DOUGLAS REDUC WKS, Douglas Smelter
Mgr: C E Mills
Supt: M G Fowler
PHELPS DODGE MERC CO, stores at Bisbee, Clifton, Douglas, Morenci
Mgr: H L Smith, Douglas
NEW CORNELIA COOP MERC CO, Ajo
Mgr: H L Smith, Douglas
(See N Mex, N Y, Tex, Wyo)

PHILLIPS ASBESTOS MINE
Globe
Mgr: Guy Phillips
MINE, Gila Cty, surface, undergr, asbestos

PIMA MNG CO
Box 7187, Tucson
Pres: H T Mudd
VP: P W Allen, A R Thomas, A D Christenson, H S Nye
Sec: D P Evans
Treas: C W Six
Purch Agt: H E Eckstein
PIMA MINE, 26 mi SW of Tucson, open pit, Cu
Gen Mgr: P W Allen
Res Mgr: E D Spaulding
Asst Res Mgr: P W Leidich
Chief Eng: V B Dale
Mine Eng: Joe Sierakoski
Geol: J A Journeay
Mech Eng: M H Nicholson

Met: R E Heralund
Elec Eng: A G Beebower
Mine Supt: R E Thurmond
3,000-TON FLOT MILL, at mine
Mill Supt. W A Hamilton
Assayer: Pete Flores
(See Calif)

PINAL COPPER MINES
c/o Herman D Rhea, Florence
PINAL COPPER MINE, Pinal County, Cu

POWER, J F
Yuma
CIBOLA #7 MINE, Yuma City, surface, undergr, Mn
Mgr: C J Monshaw
Idle

PRETTY PAT MNG CO
2800 Santa Monica Blvd, Santa Monica, Calif
PRETTY PAT MINE, Yuma County, Cu

RARE METALS CORP OF AMERICA
1st Security Bldg, Salt Lake City 11, Utah
ARROWHEAD MINE, Cameron, Navajo Indian Reservation, open pit, U_3O_8
Gen Supt: James McFarlane
Geol: Claude Barron
Eng: W L Pugate
Prod: 100 tons
RAMCO PROPERTIES, Cameron, Navajo Indian Reservation, Coconino County, open pit, U_3O_8
Mine Supt: J C McFarlane
Prod: 100 tons
240-TON ACID-LEACH MILL, Tuba City
Mill Supt: S M Runke
Asst Mill Supt. L O Davis
Mill Frm: L W Mead
Assayer: C E Wilkins
(See Idaho, Calif, Utah)

RAY MNG CO
c/o Vernon Wilden
Shiprock, N Mex
BLACK #1 MINE, Apache Cty, surface, undergr, U_3O_8, V

RED BIRD MNG CO
330 E Washington St, Phoenix
RED BIRD MINE, Maricopa County, Cu

RED BLUFF MNG CO
Young Rd, Globe
RED BLUFF MINE, undergr, U_3O_8
Gen Mgr & Mine Supt. Carl Larson
Under devel

RED CLOUD GROUP
Own: M L Lynch, John W Laivier, Prescott
MINE, 6 mi SW of Bagdad, diamond drill explor
Idle
(Sub-leased to Cyprus Mines Corp)

REYMERT EXT SILVER MINES
Box 521, Superior
Pres & Gen Mgr: Norman De Vaux
VP: Ray N Matsinger
Sec: Neil B McGinnis
Gen Supt: Fred A Bennett
REYMERT MINE, 7 mi W of Superior
Idle

RIO DEL MONTE MINES, INC
Salome
Pres & Gen Mgr: O K Gilliam
VP: Emil Anderson
Sec: E V Eckel
RIO DEL MONTE MINE, 4 mi SW of Salome, undergr, Au, Ag, Cu, Pb
Idle
GRAV MILL

ROBINSON, OHACO & LUKUS
P O Box 1471, Winslow
U_3O_8 Prod

ROXY CO
c/o Louis Sioretta, Hogales
PITTSBURGH GROUP, Santa Cruz County, Cu

RULE CONSTRUCTION CO
177 E Oak St, Globe
COPPER PRINCE MINE, Gila County, Cu

S W MNG INDUSTRIES
1416 S Sixth Ave, Tucson
HERASIO MINE, Cu
Under devel
(Leased from Mike Serrato)

SABER MNG CO
c/o R M Rutledge, Safford
Mgr R M Rutledge
BLACK HAWK MINE, Graham County, Mn

SALERNO METALS CORP
c/o J W Crotty, Patagonia
ALICE BLUE GROUP, Santa Cruz County, Cu

SAMICOL MINERALS CORP
Tucson
ANTLER MINE, Mohave County, Pb, Zn

SAN MANUEL COPPER CORP
Box 5417, San Manuel
Pres: W P Goss
VP & Sec R C Bonebrake
Treas: W P Schmid
Purch Agt: J A Gardner
SAN MANUEL MINE, undergr, Cu, Mo, Au, Ag
Gen Mgr: F H Bucheila
Asst Gen Mgr: J F Buchanan
Mine Supt. C L Pillar
Asst Supt: E K Staley
Geol: J D Pelletier
Mech Supt: C A Bilson
Ch Mng Eng: H J Steele
Mine Frm: C F Cigliana
Prod: 30,000 tons
30,000-TON FLOT MILL
Supt: E V Given
Met: A A Wallach
Ch Chem: A B Hall
140,000,000 LBS REVERB SMELT
Supt: R C Wilson
Gen Frm: L Redmond

SANDERS MINE
Sanders
Mgr: C A McCarrell
MINE in Apache County, bentonite

SAN PEDRO MNG CO
118 E 10th St, Tucson
LA ESPERANZA MINE, Pima County, Cu

SAN RAMON MINE
4834 E Broadway, Tucson
Own: Bob Cruse
MINE, 16 mi NW of Patagonia, undergr, Pb, Cu, Ag, Zn
Idle
(Leased to Weaver & Murphee Mng Co)

SANTA CRUZ COPPER CO
Box 26, Patagonia
Pres. H C Orton
MOWRY MINE, Santa Cruz County, Mn
SUNNYSIDE & VULCAN MINES, Santa Cruz County, Cu

SANTA FE URANIUM CORP
323 N Foothill Blvd, Pasadena, Calif
RED HILLS EXT #1, Mohave County, Cu

SANTA TERESA MNG CO
Safford
Sec. Paul Merrill
SANTA TERESA & FAIRVIEW MINES, Graham County, Pb
Idle

SAYAN, NELSON & GALBRAITH
14410 Halteras St, Van Nuys, Calif
U_3O_8 Prod

SCHOLZ, E A & CAZIER, J H
Bagdad
COPPER KING MINE, 7 mi S of Bagdad, undergr, Zn, Cu
Under devel
(Leased to Wah Chang Mng Corp, Bishop, Calif)

SEIFERT & SMITH
Aguila
BLACK QUEEN MINE, Maricopa Cty, surface, undergr, Mn
Mgr: Fred Seifert
Idle

SEIN FEIN MNG CO
Klondyke
Pres: Dean Nicholson
MINE, Aravaipa dist, undergr, surface, Au, Ag, Cu, Pb
Idle

SELLS, CATO
P O Box 293, Farmington, N Mex
U_3O_8 Prod

SEVIER MINERALS CO
Box 191, Richfield, Utah
Pres: Wm H Robertshaw
GEM MINE, Kingman, undergr, Pb, Zn, Cu, Ag, Au
Gen Mgr: Wm Howard
Under devel

SHANNON MNG CO
Box 308, Tombstone
Pres: M Blumberg
VP: L Bierbey
Sec: J Flory
SHANNON MINE, Cochise County, undergr, Cu, Zn, Pb
Gen Mgr. J W Faust
Mine Supt: L J Conley
Mine Frm: J Perotti
Prod: 75 tons
Under devel

SHAPLEY PROCESSING CO
1448 E Town & Country Lane, Phoenix
Own & Op: Cooper Shapley, Jr
MINE, undergr, open pit, CaF_2
Prod: 10 tons
MILL, 22 mi SW of Aguila, Ariz

SHATTUCK DENN MNG CORP
120 Broadway, New York 5, N Y
Pres: Thomas Barden
VP, S S Shattuck
Sec: John A Moss
Treas: Thomas V Tossi
IRON KING BR, Humboldt
MINE, undergr, Zn, Pb, Au, Ag, Cu
Gen Mgr: H F Mills
Supt: Elmer Tomkinson
Prod: 900 tons
1,000-TON FLOT MILLast mine
Mill Supt: Albert Pessin
(See Colo, N Y)

SHOOTING STAR URANIUM CO
P O Box 304, Flagstaff
U_3O_8 Prod

SHORTY, PAUL
Red Rock Trading Post, Shiprock, N Mex
U_3O_8 Prod

SIERRA ANCHA MNG CO
Globe
URANIUM CLAIMS, Gila County
Idle
(See Colo)

SIERRITA MNG & RANCHING CO
Box 25, Ruby Star Rt, Tucson
Treas: Leander M Harris
GOLDEN FLEECE MINE, Pima County, Au
Idle
COWBOY MINE, Pima County, Pb, Ag, Zn
Idle
OLD POWERS MINE, Pima County, Cu

SILVER FLAKE MINE
306 S Marina St, Prescott
Own: W R Fitzgerald
MINE: 5 mi S of Prescott, undergr, Zn, Pb, Ag, Au, Co
Geol: W M O'Dell
Idle
MOLLY MINE, Mo, Ag, B, Ni, Cu
Gen Mgr. W M O'Dell
Under devel

SILVER QUEEN MNG CO
124 N 2nd Ave, Phoenix
Sec-Treas: Floyd A Rains
SILVER QUEEN #1-4 MINES, Yavapai County, Ag
Idle

SILVER REEF MINE
Box 402, Casa Grande
MINE, 13 mi S of Casa Grande, undergr, open pit, Ag
Idle
(Leased to W L Clayton)

SIMPSON, GEORGE R
514 N Wall St, Farmington, N Mex
U_3O_8 Prod

SISKON CORP
Box 880, Reno, Nev
AMERICAN EAGLE & OLD RELIABLE MINES, Cu
Mine Frm: M R Biswell, Box 58, Mammoth
(Leased from Lewis Douglas, Tucson)
GLOBE & PRINCE MINES, Cu
Mine Frm: M R Biswell
(Leased from Phelps Dodge Corp)

SITTON & CO
1133 W McDowell Road
Phoenix
KANAB #4 & LONE WOLF MINES, Maricopa County, Mn

SMITH, GEORGE W SR
Cortez, Colorado
U_3O_8 Prod

SMITH, H C
Globe
LITTLE JOE MINE, U_3O_8

SNYDER M & M CO
Box 41, Sonoita
Mgr & Own. Phil Snyder
CONGLOMERATE MINE, Pima County, Cu

SOREN ASBESTOS CORP
Box 1438, Globe
Pres. Wm W Sorsen
VP: Vance Thorsburg
Sec: Loraine Sorsen
SALT RIVER GROUP, Gila County, undergr, asbestos
Under devel

SOUTHERN CROSS MNG CORP
Box 47, Quartzsite
Mgr L A Aplington
LUCKY LEAD #1-6, 10 mi S of Bouse, undergr, Pb, Zn, Ag, Au
Idle

SOUTHWEST MINES CONTR CO
Box 1041, Prescott
Gen Mgr. Joe Ward
GREAT SCOT MINE, 19 mi SE of Prescott, undergr, Pb, Zn, Au, Ag
WHITE PEARL, 7 mi S of Prescott, undergr, WO_3
Idle

SPAR MNG CO
Box 96, Ft Thomas
Pres. Wm C Rhodes
Supt: C R Rhodes
SPAR MINE, undergr & open pit, CaF_2
Under devel

SPARKES, GRACE M
Star Rt, Hereford
Mgr: Perry L Bones
STATE OF TEXAS MINE, Star Rt, Hereford, 28 mi W of Bisbee, undergr, Zn, Pb, Ag, Au
Idle

SPARTAN MNG CO
544 Beale St, Kingman
DEMOCRAT MINE, undergr, U_3O_8
Gen Mgr: Charles E Howell
Asst Gen Mgr: Ralph E Asther
Gen Supt: Dick Hart
Geol: Lorenzo Demars

SPENCER, C L
P O Box 33, Farmington, N Mex
U_3O_8 Prod

SPENCER URANIUM MNG
Atlas Bldg, Salt Lake City, Utah
U_3O_8 Prod

STANLEY BUTTE MNG CO
104 Winters Bldg, Phoenix
STARLIGHT GROUP, Graham County, Cu

STETTER, J J
Box 27, Quartzsite
TUNGHILL, WO_3

STEVENS, CHAS E
Box 772, Clifton
STEVENS LEASE OR MOLINAR MINE, Cu
(Leased from Phelps Dodge Corp)

STOVALL, AL
1644 Palmcroft Dr, Phoenix
LAKE, LOVE, & MAGGIE MINES, Mohave County, undergr, Mn
MAGMA MINE, Pinal County, undergr, Mn

STOVALL MANGANESE MNG CO
O K Mills, c/o Al Stovall, 1644 Palmcroft Dr, Phoenix
STOVALL APACHE MN MINE, Gila Cty, undergr, Mn
Mgr: O K Mills (Phoenix)
MILL, at Stovall Apache mine

SUMMIT COPPER MINES, INC
Box 116, Payson
Pres & Gen Mgr: R W Thompson
VP: Dr A L Gagnier
Sec: Nina M Thompson
SUMMIT MINE, 6 mi NW of Payson, undergr, Cu, Au
50-TON GRAV MILL
Idle

SUN - GOLD MNG CO
711 Valley Nat'l Bldg, Tucson
Pres & Mine Supt: Alfred E Turner
Sec-Treas & Gen Mgr: John C Gung'l
SUN-GOLD GROUP, Pima County, undergr, Au, Ag, Pb, Cu
Under devel

SUNRISE MNG CO
Box 82, Amado
Pres: A P Simms
VP & Gen Mgr: Edward A Mack
Purch Agt & Gen Supt: F G Mack
GLOVE MINE, 8 mi E of Amado in Santa Rita Mts, undergr, Pb, Ag, Zn, WO_3
Prod: 50 tons
(See Texas)

SUNSET MNG CO
213 Minna St, San Francisco, Calif
Pres: J L Baiocchi
VP: W O Kay
Sec: Charles Greenberg
MINE, Pinal County, Au, Ag, Cu
Idle

SUPERIOR INDUSTRIES, INC
309-11 Meadows Bldg, Dallas, Tex
Pres & Purch Agt: O T Ball
VP: W C Maxey
Sec-Treas: Isaac Gibson
MARY T & SANDY NO 2 MINES, Superior, open pit, perlite
Gen Mgr: O T Ball
Asst: Marion Mognett
Prod: 50 tons

SUSAN B URANIUM CORP
34 Prospectors Lodge, Moab, Utah
MINE, undergr, surface, U_3O_8, WO_3
Under devel
(See Colo, Utah, Wyo)

SWISSHELM MINE
Box 603, Tombstone
Lessee: J F Rydbam
MINE, 60 mi NE of Tombstone, undergr, Au, Ag, Pb
Idle

SYLVANIA MNG & DRILLING CO
c/o John H Wells, Shiprock, N Mex
OAK SPRINGS MINE, Apache County, surface, undergr, U_3O_8, V

TEJON MINE LSG & DEV CO
Box 603, Tombstone
Owner: William Ward
TEJON MINE, 18 mi NE of Tombstone, undergr, Cu, Pb, Au, Ag

TEJON TOM SCOTT MINE
c/o Ignacio Vales, Gleeson
MINE, Cochise County, undergr, Cu

TENNEY, W B
Phoenix
A & M MINE, Yuma County, surface, Mn

THREE R MINE
Patagonia
MINE, Santa Cruz County, Ag, Cu, Pb
Idle

TIAJUANA MINES, INC
2200 W Van Buren, Phoenix
Pres & Gen Mgr: C T Tucker
VP: Harold W Rehfeld
Sec: H W Rehfeld
Gen Supt & Geol: Joseph G O'Brien
Purch Agt: Ch T Tucker
TIAJUANA & HERR GROUPS, Amado, Santa Cruz County, undergr, Pb, Zn, Ag, Cu
Idle

TIDELANDS OIL CO
1801 Wilson Tower, Corpus Christi, Texas
BIG BANANA MINE, WO_3
Mgr: M F McKnight, Box 30, Sells

TIP TOP MNG CO
Box 27, Sahuarita
FORBES MINE, Pima County, Cu

TITAN URANIUM CO
c/o A J Giannini, Albuquerque, N Mex
R F & R MINE, Apache County, surface, undergr, U_3O_8, V

TOUT, EDWIN I
Tucson
TOUT MINES, INC, Cochise County, surface, undergr, Cu
Idle

TRUE BLUE MNG CO
Salome
TRUE BLUE MINE, Yuma County, surface, undergr, Au, Ag
Mgr: H L Cast
Idle

TULSA MINERALS CORP
Box 1662, Globe
Pres & Gen Mgr: J S Burden
VP: P T Thibodaux
Sec & Treas: W O Eastman
Purch Agt: John W Cleary

LUCKY BOY & SUCKERITE MINES,
Gila County, undergr, U_3O_8
Asst Gen Mgr & Geol: H F Beasley
Gen Supt: Everett Costle
Lucky Boy Frm: K M Craig
Suckerite Frm: John L Carter
Prod: 90 tons
(See Okla)

TURKEY CREEK PLACER
Chester
Op: Thomas R Chester
MINE, Yavapai County, Au
Idle

UNION GYPSUM CO
Winkelman
UNION GYPSUM MINE, Pinal County, surface, gypsum
Mgr: Archie Lee

UNITED MINERALS CORP
518 Felt Bldg, Salt Lake City, Utah
Pres: George W Snyder, Jr
VP: G W Snyder, H A Covey
Sec: Guy Snyder
RIP VAN WINKLE & LUCKY STRIKE MINES, undergr
Idle
(See Nev)

UNITED MINES CO
Chloride
Pres: M B Maxwell
VP: Dr J O Irish
Sec-Treas: C L Lind
EVAHOM, LITTLE TENN, & SCOTCH LASSIE GROUPS, Au, Ag, Zn
Idle

URANIUM & OIL DEVEL PROJECT, INC
3411 N 14th St, Phoenix
Pres & Gen Mgr: Guy J Stumpff
VP: Earnest Feighner
Sec-Treas & Geol: P H Lund
LUCKY HORSESHOE MINE, Gila County, open pit, U_3O_8, rare earths
Under devel

U S LIME PRODUCTS CORP, GRAND CANYON LIME & CEMENT CO DIV
2244 Beverly Blvd, Los Angeles, Calif
NELSON PLANT, open quarry, vert kilns
Supt: Roy Lauer
(See Calif, Nev)

UNITED STATES SMELTING REFINING & MNG CO
75 Federal St, Boston, Mass
Pres: F S Mulock
GOLD MINE, Mohave County
Idle
(See Alaska, Utah)

U S TUNGSTEN CORP
Box 590, Congress
Pres: J P Zannaras
VP: Charles P Lower
Sec: John P Robinson, Jr
ZANNARAPOLIS MINE, 35 mi NW of Congress, undergr, Surface, scheelite
Idle
Mine Frm: L M Rutledge
250-TON GRAV -FLOT MILL
Mill Frm: Jess Parris

UNIVERSAL COPPER CORP
2603 E Third St, Tucson
Pres: James E Gaylord
TROY MINE, Cu, Pb
Under devel.

UNIVERSAL URANIUM & MLG
323 Newhouse Bldg, Salt Lake City, Utah
U_3O_8 Prod

UPPER CANYON MINE
c/o O O Bearick, Farmington, N Mex
MINE, Apache County, undergr, U_3O_8

URAINBOW, INC
908 Kearns Bldg, Salt Lake City, Utah
Pres: Henry B Squires
VP: Robert W Shields
Sec-Treas: Val S Scoville
HACK'S CANYON MINE
Fredonia, undergr, U_3O_8, Cu
Undergr production
Mine Supt: Lon Scoville
Idle

URANIUM EXPL & COPPER CO
300 Fremont, Rm 108, Las Vegas Nevada
U_3O_8 Prod

URANIUM RESERVE CORP
c/o Win Mower, Bluff, Colo
CATO SELLS TRACT, Apache Cty, surface, undergr, U_3O_8, V

UTCO URANIUM CORP
310 1st Nat'l Bank Bldg, Denver Colo
Pres: Geo S Casey
VP: Fred C Clymer
Sec: H Clark Thompson
Treas: John Aiff
Asst Treas: J D Vander Ploeg
HUSKON #6-18 MINES, Cameron, open pit, U_3O_8
Gen Mgr & Geol: Mason W Rankin
Frm: Charles Huskon
Prod: 2000 tons
(See N Mex, Utah)

VANADIUM CORP OF AMERICA
Durango, Colo
COVE MESA MINES #1, 3 & 16, Apache Cty, surface, undergr, U_3O_8, V
Mgr: Woodrow Weaver, Shiprock, N Mex
MONUMENT #3 MINE, Monument Valley, undergr, U_3O_8, V
Mine Supt: Fred Petersen
Mgr: Carl Bell, Durango, Colo
OAK SPRINGS PLOT #10, Apache Cty, surface, undergr, U_3O_8
Mgr: Woodrow Weaver, Shiprock, N Mex
RATTLESNAKE MINE-PLOT #7, Apache Cty, undergr, U_3O_8, V
Mgr: Woodrow Weaver, Shiprock, N Mex
(See Colo, N Mex, N Y, Utah)

VANADIUM INVEST CO
Box 1008, Globe
Mgr: R Scott
#1 GROUP, Pinal County, Pb, Ag
Idle

VASSER, C F & BILL
Box 322, Salome
JACK POT #1, WO_3
Idle

VENTURES, LTD
Patagonia
VOLCANO & PINA GROUP, Santa Cruz County, Cu

VERDE VALLEY INDUSTRIES, INC
c/o Riney B Salmon, Phoenix
Title & Trust Bldg, Phoenix
Sec-Treas: Riney B Salmon
UNITED VERDE MINE, Yavapai County, Cu

VERMILLION CLIFFS MNG CORP
Box 1837, Flagstaff
Pres: C E Knowles
VP: R E Darling
Sec-Treas & VP of Oper: Allen C Tester
MINES, Cameron, Ariz area, Navajo Indian Reservation, open pit, U_3O_8
Gen Mgr: Allen C Tester
Under devel
(See N Mex)

VERNON, LEWIS & DAVIS
Willcox
V L & D MINE, Cochise County, surface, undergr, Au
Mgr: Ben Lewis
Idle

VIA, CLARENCE
1006 Old Pecos Rd, Santa Fe, N Mex
MINE, U_3O_8
STELL & MOODY MINE, Gila Cty, undergr, Mn
Mgr: Lee Cook (Claypool)

WALAPAI HUALAPAI
Yucca
BONNY RUTH MINE, Mohave Cty, surface, undergr, WO_3
Mgr: Frank McCarty
Idle

WATKINS, T
403 E 2nd St, Casa Grande
CAMINO MINE, Pinal County, surface, undergr, Pb, Ag

WEST COAST MINERALS
Flagstaff
WHITE MESA MINE, Cu

WESTERN MNG & EXPLORATION CO
940 Ash Ave, Tempe
BLACK BRUSH MINE, U_3O_8
Mgr: C A Saylor
Under devel

WHITE CANYON MNG CO
Phoenix
McGREGOAR MINE, Mohave County, surface, Mn
Mgr: F A Sitton
Under devel

WHITE TAIL MNG CO
330 Bankard Ave, Nogales
BACA FLOAT #3, Santa Cruz County, Pb, Zn

WILKERSON, J L & CO
Crown King
Mgr: Ed W Carle
MINE in Yavapai County, Au, Ag
Under devel

WILKINS MINE GROUP
Box M, Patagonia
Own: Bond Mng Trust
Lessee: Thomas Headley
MINES, Santa Cruz County, Ag, Pb
Idle

C D WILSON MNG
Box 102, Sahuarita
Op: C D Wilson
MINE, Pima County, open pit, Au, Ag, Cu, Pb
Prod: 400 tons

WILSON, HOWARD
P O Box 469, Gallup, N Mex
U_3O_8 Prod

WOOD, JOHN JR
Tucson
MARGARITA MINE, Cochise County, surface, undergr, Cu

WORLD MANGANESE CORP
Box 37, Wenden
BLACK JIM MC GREGOR, MC GREGOR, & NEEDLE EYE MINES, Mohave County, Mn

YELLOW OXIDE MINE, A PARTNERSHIP
c/o Mgr E S Thelan, Globe
MINE, Gila County, surface, Mn

YUCCA MNG CORP
Box 1001, Deming, N Mex
DARIUS MINE, Gila County, Mn

YUCCA MNG & MLG CO
Box 67, Yucca
Pres & Gen Mgr: R J Dalton
VP: Ferd Wolf
Sec: Ben F Williams
ANTLER MINE, 11 mi E of Yucca, undergr, Cu, Zn, Ag, Au
Prod: 150 tons
150-TON FLOT MILL
Idle

ZODIAC URANIUM, INC
320 Ness Bldg, Salt Lake City, Utah
Pres: Leo G Bateman
VP: M G White
Sec: Paul Jones
Treas: Gladys B Hervey
NAVAJO INDIAN RESERVATION
MINE, surface, U_3O_8
Geol: Leland J Davis
Under devel
(See Mont)

ARKANSAS

ALUMINUM CO OF AMERICA, MNG DIV
1501 Alcoa Bldg, Pittsburgh 19, Pa
Pres: I W Wilson
Exec VP: F L Magee
VP (of Mng Div): Lawrence Litchfield, Jr
Treas: E B Wilber
Sec: A M Hunt
Gen Purch Agt: R O Keffer
MINES, Bauxite, bauxite
(See Ill)

AMER CYANAMID CO
Box 726, Little Rock
MINE, 4 mi S of Little Rock, surface, bauxite
Mine Mgr: R H Harris
(See Fla, Ga, NY, Va)

APEX MNG CO
Cushman
MINES, Cushman, open pit, Mn

ARKANSAS GYPSUM CO
Murfreesboro
Pres & Gen Mgr: Vernon B Lewis
GYPSUM MINE, Murfreesboro, undergr, surface

ARKANSAS MNG & EXPLOR CO
Batesville
MINES, N of Batesville, open pit, Mn

BAXTER, LEONARD
Cushman
MINES, Cushman, open pit, Mn

DICKINSON - McGEORGE, INC
Box 348, Pine Bluff
MINE, bauxite

DULIN BAUXITE CO
Sweet Home
MINE, bauxite

HARGUS MNG CO
Mena
Pres: Will H Hargus
VP: Will H Hargus, Jr
MINE, Polk County, open pit, Mn
Prod: 10 tons
Under devel
Geol: William Campbell
Assayer: Bruce Williams

MAGNET COVE BARIUM CORP
Box 6504, Houston 5, Texas
MINE, Magnet Cove, barite
(See Wyo)

MILLER & MC GEE
Batesville
MINES, N of Batesville, open pit & undergr, Mn

NATL LEAD CO, BAROID DIV MAGNET COVE OPER
Malvern
MINE, 12 mi N of Malvern, surface, Ba
Supt: E C Farrell
Asst Supt: W A Halbert
1500-TON FLOT MILL
(See Calif, Kans, La, Mont, Mo, Nev, NY, Tenn, Tex & Wyo)

POROCEL CORP
Menlo Park, N J
Pres: W W Gary
VP: A G Blake
Sec: W E Sawyer, Jr
Treas: C W Nielsen
Prod Dir: T L Falkner
MINE, Berger, open pit, bauxite
Mgr: M N Rowland

REYNOLDS MNG CORP
Boyle Bldg, Little Rock
Pres: Walter L Rice
VP: R H Zeglin
Sec: Allyn Dillard
Treas: C E Coghill
Purch Agt: M W Henry
REYNOLDS MINE, Box 300, Bauxite, undergr, open pit, bauxite
Gen Mgr: R H Zeglin
Asst Gen Mgr: H T Middlebrook
Supt, open pit: H T Middlebrook
Supt, undergr: G M Wagner
Geol: J H Moses
Elec Eng: J T Harper
Local Purch Agt: J W Glover
Asst Mine Supt: J A Fuller
Mine Eng: J R Krause
Prod: 3,000 tons
(See Colo, Va)

UTLEY, HARVEY
Box 431, Batesville
MINES, N of Batesville, open pit, Mn

CALIFORNIA

ADAMS, ALFRED A
Columbia
MOUNTAIN LILY MINE, undergr, Au
Gen Mgr: James T Owens
Lessee: Robert Jackling
Under devel
20-TON MILL, at mine

ADAMS, HARRY
1404 Waterman St, San Bernardino
ADAMS TALC MINE, San Bernardino, talc

AJAX TUNGSTEN CORP
139 S Main St, Bishop
Pres & Gen Mgr: C M Hall
VP: George Temple, Gayle Green
Sec: Bruce R Thompson
Treas: J E Sexton
TUNGSTAR, MANCHU VALLEY
FERNANDO-DURHAM MINES, undergr, WO_3
Gen Supt: J E Sexton
Mine Supt: Geo L Hall
Prod: 100 tons
100-TON GRAV MILL, Bishop
Mill Supt: Day Johnson

ALHAMBRA CONSOL MINES INC
1901 Cahuenga Av, Hollywood
Pres & Gen Mgr: O H Griggs
VP: Walter W Smith
Sec & Asst Gen Mgr: Joseph Nagy
Treas: Frank C Weller
ALHAMBRA MINE, Box 727, Placerville, undergr, Au
Mine Supt: Chris Matkovich
MILL, at mine,
Prod: 40 tons
(See Nev, Utah)

ALLIANCE TALC MINE
Darwin
Op: George W Kenet
MINE, 17 mi E of Keeler, steatite talc

ALLSOP & JOHNSON
942 Carson St, Barstow
MOHAWK MINE, San Bernardino County, Ag,

ALMADEN DUMPS
Almaden
MINE, Santa Clara County, Hg

ALTA COPPER CO, INC
Box 309, Gasquet
Pres & Gen Mgr: Joe Reimers
Sec: Ralph Yoder
Geol: Roger Beals
ALTA COPPER MINE, 8 mi E of Smith Rtv, Del Norte Co, undergr, Cu
Under devel

AMERICAN ASBESTOS MNG CORP
11 W 42nd St, New York
MINE, Calaveras County, asbestos
Idle
VOORHEIS MINE, Copperopolis, asbestos

AMERICAN CHROME CO
1 Montgomery St, San Francisco
Pres: Willis A Ewan
VP & Gen Mgr: John Biey
Sec: Geo M Spradling
Treas: John L Luzena
Purch Agt: D W Graves
MOUAT MINE, Nye, Montana
(See Montana)

AMERICAN INTERNATL MNG & MLG CO
3750 S Western Ave, Los Angeles 5
ITALIAN MINE, Amador County, Au

AMERICAN MINERAL CO
840 S Mission Rd, Los Angeles 23
Pres: A H Stahmer
VP & Gen Mgr: W A Merle
WHITE ROCK MINE, 12 mi NW of Cantil, surf, ceramic clay
Prod: 400 tons per mo
Mine Supt: Paul Edgemon
100-TON MILL, Los Angeles, commercial grinding
CLAY PIT, Kern County

AMERICAN POTASH & CHEM CORP
3030 W 6th St, Los Angeles 54
Pres: Peter Colefax
VP: W J F Francis
Sec: R J Hefler
Treas: L A Adams
Purch Agt: L H Cornelius
MINE, Lake Brinee, potash, borax, soda salts, Br, Li
Prod: 650,000 tons yearly

AMERICAN SMELTING & REFINING CO
405 Montgomery St, San Francisco
MINING DEPT
Res Geol: L K Wilson
BLAST FURNACE, Selby: lead
Mgr: W S Reid
Gen Supt: H P Wagner
Purch Agt: J M Hanna
Smelter Supt: F C Moran
Refin Supt: B K Shedd
Mast Mech: W H Heinzen
(See Ariz, Colo, Idaho, Ill, Kans, Md, Mont, Nebr, N J, N Mex, NY, Tex, Utah, Wash, and Federal Mng & Smelting Co, Mo)

AMACONDA COMPANY, THE
25 Broadway, New York 4, New York
Pres: Clyde L Weed
VP: Edward S McGlone
Sec-Treas: C Earle Moran
Purch Agt: A Baird Harris, Jr
DARWIN MINE, Darwin, undergr, Pb, Zn, Ag
Gen Mgr: F E Tong
Mine Supt: J C Kinneberg
Mine Frm: G C Beaman
Geol: N L Degner
Mech Eng: W H Pingley
Elec Eng: F J Pertsch
Prod: 465 tons
FLOT MILL, Darwin
Supt: J H Teel
Asst Supt: W B Davis
Assayer: Louis Warshaw, Jr
Prod: 465 tons
SHOSHONE MINE, Tecopa, undergr, Pb, Ag
Gen Mgr: F E Tong
Mine Supt: Harold Hill
Geol: Robert G Coucher
Mech Eng: Guy Haskins
Prod: 225 tons
Under devel
125-TON FLOT MILL, at Shoshone mine
Supt: J H Teel
Asst Supt: Harry Kroen
Assayer: Don Warner
(See Idaho, Mont, Nev, N Mex, N Y, Utah)

ANDERSON, AL
600 E Bay St, Balboa
VIRGINIA DALE MINE, San Bernardino County, Au

ANDERSON ROCK PLANT
Box 1272, Fresno
MINE, Fresno County, placer, Au

ANDREWS MNG CO
Box 482, Healdsburg
Pres: Lowell Andrews
VP: Mel Woods
Sec: Merle Hefley
CRYSTAL MINE, 10 mi NE of Healdsburg, undergr, cinnabar
Own: P G Cox
(Leased to Andrews Mng Co)
Under devel

ARGENTINA CONS MNG CO
12527 Hortense, N Hollywood
Pres: Harry Lee Martin
VP & Sec: Edwin C Horrell
MINE, Ag, Pb, Zn, V_2O_5
Idle
(See Nevada)

ARGO, ROY, BOETHING, E E & GRIFFITHS, LAWRENCE CO-OWNERS
c/o Roy Argo, 12837 S Lemo Dr, Whittier
LILLY #1, 2, 3, 4 MINES, Slate Range dist, undergr, Au, Ag, Pb, Cu, Mn, U_3O_8
Supt: Roy Argo
Assay: Smith Emery
Under devel (1, 2, 3 Lille)

ARGUS DEVEL CO
P O Box 8, Trona
DAVENPORT & RUTH MINES, Inyo County, Au

ASHLAND MNG CO
433 "J" St, Crescent City
MINES, Del Norte Co, Cr
FAIRVIEW MINE, Hamburg, undergr, Cr

ATKINS, GERALD R
Box 95, Caliente
LITTLE JOE MINE, Kern County, Pb

B J B ASSOCIATES
P O Box 151, Nevada City
GERMAN BAR MINE, Nevada County, Au

BACHELS, ANDREW & PAUL
80 Pierce St, San Francisco 17
EMPIRE-LONE STAR GROUP, 12 mi NE of Downieville, undergr, Au
MEXICAN MINE, 2 mi E of Goodyear's Bar, Au
Idle

BARIUM PROD, LTD
(Subsid of FOOD MACH & CHEM CORP)
SAVERCOOL MINE, Pitmas County, barite
Idle
ALMANOR MINE, Greenville
Idle
(See Barium Products, Nevada, Inter-mountain Chem, Wyo)

BEAM SMELTERS
10535 Buford Ave, Inglewood 2
Own & Pres: L Mills Beam
BEAM SMELTERS, undergr, Au, Mn, Co

BEAUREGARD, CHAS E
Box 708, Bishop
SIERRA-WASHINGTON GROUP, Mono County, Au

BECK, MARTIN
Box 343, Mojave
GUNTREE MINE, Kern County, WO_3, Sb
Idle

BEDELL, STUART
Big Pine
WAUCALLIA MINE, Inyo County, WO_3
Idle

BEEGUM MNG CO
4311 Rosedale Hway, Bakersfield
MINE, 7 mi SW of Platina, open pit, chromite
400-TON FLOT MILL, at mine

BEELS, ROY E
231 Vine, Modesto
MOONLIGHT MINE, Mariposa County, Au

BELDEN AMADOR MINES, INC
Box 30, Pine Grove
Pres: Donald Griffin
VP & Gen Mgr: Leon M Banks
Sec: Don A Weber
BELDEN MINE, Pine Grove, 20 mi E of Jackson, Au, Ag
Idle
40-TON GRAV FLOT MILL

BENNETT MNG CO
Big Bar
MINE, Trinity County, placer, Au, Ag

BENOIST, M L
Box 193, Weaverville
CHLORIDE & GLOBE MINES, 23 mi from Weaverville, underg, surface
Idle
30-TON MILL

BEST MINES CO
Box 177, Downieville
Pres: I L Best
VP: B C Austin
Gen Mgr: L L Huelsdonk
GOLD BLUFF, BRUSH CREEK & OXFORD MINES, undergr Au
Mine Supt: W T Reed, Jr
Eng: B C Austin
Master Mech: A B Hinton
FLOT MILL
Supt: John Folsom
Frm: Vernon Huffman

BIG FOUR MNG & MLG CO
P O Box 218, Lomita
Pres: Lester G Michaelis
VP: Sim M Bramlette
Treas: Harold Brett
Purch Agt: Roy Johnson
MINES, Cima, Paris Lorraine, Kramer, open pit, placer, Th, U_3O_8, Ba, magnetite, Zr
Mine Supt: Roy Johnson
Asst Mine Supt: Sim Bramlette
Under devel
(See Nev)

BIG SEVEN MNG CO, INC
233 S "C" St, Lompoc
Pres & Gen Mgr: D E Neuschwander
VP & Geol: R G Hendy
Sec-Treas & Mech Eng: R E Purtin
Gen Supt: O C Benedict
BRIGHT FUTURE MINE, Idria Mng dist, San Benito County, open pit, Cr_2O_3
Prod: 30-50 tons

BLACK GIRL MINES CO
2813 Hollins St, Bakersfield &
Box "M", Ouray, Colo
VP & Gen Mgr: J M McFadden
Sec: Doris E McFadden
Geol: C M Shaw
(See Colo)

BLACKSTONE MINES, INC
5208 Barrett Ave, Richmond
Pres: Lawrence A Sanchez
VP: Louis G Sanchez
Sec: Uno Lipisto
BLACKSTONE MINE, West Point, undergr, Au, Ag, Pb
Gen Mgr: L A Sanchez
Gen Supt: E H Syms
Idle
50-TON FLOT MILL, at mine
Supt: Levi Lipisto

BLEW JORDAM ZINC MINE
2821 Bichel St, Los Angeles 33
Own: R B Lyttle
MINE, 15 mi NW of Fontana, undergr, Zn, Pb, Ag, Cd
Under devel

BLUE CHIP MNG CO
c/o Erwin Ebeling, Panamint Springs Resort
BIG FOUR, via Lone Pine, Ag

BLUE LIGHT SILVER MINES CO
Chapman Ranch, Fullerton
Pres: C Stanley Chapman
Sec: Sam L Collins
SILVERADO MINE, 20 mi E of Orange in Silverado Canyon, Pb, Zn, Ag
Mgr: W A Young
50-TON CONC & FLOT MILL, at mine
Idle

BLUE RIDGE MIDWAY GOLD MINES CO, LTD
Callahan
Pres: Gerald B Hartley
Sec-Treas: S H Hartley
TIPTOP & HILTON CREEK MINES, Mono County, WO_3
SUGAR HILL MINE, Callahan, Au
Idle
BIG BLUE MINE, Callahan, Cu
Idle
PILOT MINE, Downieville, Au
Idle

BLUEBIRD MINE
P O Box 575, Winterhaven
Own: Robert K Foster
MINE, 3 mi NE of Ogilby
surface, mica
Gen Mgr: Robert K Foster
Prod: 5 tons
SIDEWINDER GRAV MILL, 7 mi W of Winterhaven, water-wash mica
Prod: 5 tons mica

BLYTHE MANGANESE CO, INC
8845 W Olympic Blvd, Beverly Hills
Pres: Georges F Kremm
Sec: G Wolfenheimer
ARLINGTON GROUP, P O Box 335, Blythe, undergr, & open pit, Mn
Prod: 250-350 tons
300-TON GRAV MILL, Inca Siding
Mill Supt: A F Garlik
(See Calrado Devel Co)

BON TON MINING CO
Murphys
BOWER LODE MINE, East Belt dist, Au, Ag
Idle

BRADFORD, L M
Box 207, Madera
DAULTON MINE, Daulton dist, Ag, Cu, Pb
Idle

BRADLEY & ECKSTROM, INC
24 California St, San Francisco
Pres: E O Ekstrom
VP & Gen Mgr: R F Belmke
MINES, Ariz, Calif, Nev, Utah, Idaho, Ore, surface & undergr, Cr, Fe, CaF_2, Mn, WO_3, rare earths, asbestos
150-TON GRAV MILL, Castella
Supt: C Robinson
(See Ariz, Idaho, Nev, Oreg, Utah)

BRADLEY MINING CO
660 Market St, Rm 515, San Francisco 4
Pres: Worthen Bradley
Exec VP: John D Bradley
VP: James P Bradley
Sec-Treas: G C Orton
REED MINE, Lower Lake, Hg
(Leased)
SULPHUR BANK MINE, Clearlake Oaks, Hg
GREAT WESTERN MINE, Middletown, Hg
(Leased)
(See Idaho, Nevada)

BRIGGS, HARRY E
Box 612, Trona
RED CLOUD MINE, 10 mi E of Ballarat, Panamint Mts, undergr
Au, Ag, Pb
Under devel
SOUTHERN HOMESTAKE MINE, 4 mi S of Ballarat, undergr, Au, Ag
Under devel

BROCK, ROBERT
River Pt, Box 23, Madera
HEISKELL PROP, Madera County, Au
Idle

BROWN, EUGENE R
O'Brien, Oregon
HIGH PLATEAU MINE, Del Norte County, Cr

BROWN, JOSEPH GABEL
Camptonville
DEPOT HILL MINE, Yuba County, placer, Au, hydraul and wash plant
Prod: 300 cu yds gravel from channel pit

BROWN BEAR MINES
Box 98, French Gulch
Gen Mgr & Consul Eng: E E Erich
BROWN BEAR, TANGLE BLUE & REED MINES, 13 mi W of French Gulch, Shasta County, undergr, Au
Idle
75-TON GRAV-FLOT MILL at Brown Bear
30-TON GRAV-FLOT MILL at Tangle Blue

BROWN'S CREEK PLACER
Box 23, Weaverville
GOLD PLACER, Trinity County
Idle

BROWNSTONE MNG CO, INC
Box 394, Bishop
Pres & Gen Supt: W V Skinner
BROWNSTONE MINE, Bishop, 20 mi W of Bishop, undergr, scheelite
LE MOYNE MINE, 19 mi NW of Towns Pass, Death Valley, undergr, Pb, Ag, Au
Prod: 20 tons
Mine Supt: W V Skinner

BUCHENAU, H J
Star Rt, Box 17, Madera
JESSIE BELL MINE, 15 mi NE of Madera, undergr, Cu, Au, Ag
Under devel
Prod: 30 tons
Mine Supt: Bud Syms
10-TON FLOT MILL, Garfield, Utah
Mill Supt: Pete Rocati

BUCKMAN LABORATORIES, INC, MNG DIV
Geyser Road, Cloverdale
Pres & Gen Mgr: Dr S J Buckman
VP: W D Stitt
Sec-Treas: C H Turner
Purch Agt: M Blakeslee
BUCKMAN MINES, undergr, open pit, Hg
Supt: Roger H Miller
Frm: A E Turpin & H D Fields
80-TON MILL, at mine
Frm: G R Martensen
Under devel

BUENA VISTA NO 2 MINE
Box 25, Redding
Own: H G Graves
MINE, 3 mi W of Redding, Au, Cu, WO_3, U_3O_8
20-TON FLOT MILL
Idle

BUNKER HILL CO, THE
The Bunker Hill Bldg, 640 Market St, San Francisco 4
Chmn of Bd: Stanley A Easton
Pres: John D Bradley
VP: Emmett G Solomon, W G Woolf, D L Feathers, R H Cutting
Sec: D L Feathers
Treas: Emmett G Solomon
Purch Agt: Gil Mayes, Kellogg, Idaho
(See Idaho, Wash)

BUNKER HILL MNG CO
Box 1347, Redding
Mgr & Eng: A Mansfield
BUNKER HILL MINE, 3 mi NW of Redding, undergr & surface, Au, Ag Cu
Idle

BURGEN & OLSON MNG CO
P O Box 83, 839 Washington St, Hollister
STAYTON & NORTH STAR CLAIMS, Merced County, Hg

BURNS & SMITH COMB MINES
Box 15, Tecopa
Pres: Bob Burns
VP: Hugh Smith
Sec: E C Hall
BAGDAD CHASE MINE, Ludlow, undergr, Au, Cu
Idle
SMELTER, Hayden Ariz

BURRO SHOE MNG CO, INC
2033 Baylor St, Duarte
Pres: Audley L Smith
VP: Cash L Swinney
Sec-Treas: Wm J Clark
BURRO SHOE MINE, Saline Valley dist, open pit, Cu, Mo, Au, Ag
Under devel

BURTON MINES, INC
Rosamond
Pres & Gen Mgr: C G Burton
Purch Agt: George McNamee
TROPICO MINE, 5 mi W of Rosamond, undergr, Au, Ag
Asst Mgr: G A Settle
Idle
100-TON CYANIDE MILL, at mine
Frm: Alec Burton
Assay: Frank Stemmons
SMELTER, at mill
Prod: 1,000 lbs yearly

BUTLER MNG & DEVEL CO, INC
1544 Zinfandel Drive, Box 39, Rancho Cardova
SUGAR LOAF MINE, El Dorado County, Au

BUTTE LODE MNG CO
Box 195, Randsburg
Pres: Bert Wegman
BUTTE LODE MINE, Kern County, undergr, Au, Ag
CUSTOM MILL

BUTTE MINES
1120 Union Ave, Bakersfield
Own & Op: J E Huston
MINE, 12 mi E of Glenville, undergr & surface, WO_3
Supt: John Hitchcock
MILL, at Glenville

BUTZ, ALBERT
Box 1103, Nevada City
SUNSHINE LODE, Grass Valley, Au
Idle

C A M LEASING CO
Iowa Hill
OCCIDENTAL MINE, Placer County, Au
Idle

C M S STRATEGIC METALS, INC
6000 SE Foster Rd, Portland 6
CLAIMS, Del Norte Co, Mn
Idle

CACHUMA MNG CO
P O Box 96, Santa Ynez
CORRALES MINE, Santa Barbara County, Cr_2O_3

CALARI MNG CO
3939 Linden, Long Beach 7
Pres & Gen Mgr: L F Albrecht
Sec-Treas: C M Smith
Gen Supt: V H LeMay
(See Ariz)

CALAVERAS CENTRAL GOLD MNG CO, LTD
Angels Camp
Pres & Gen Mgr: Harry Sears
Mgr: Desmond Sears
MINE, undergr, placer, Au
CRUSHING & SCRUBBING PLANT, Au, Highway aggregates
Prod: 600-800 tons

CALIFORNIA COPPER INC
1106 Williamson Way, Fullerton
WICHITA & YELLOW DIRT MINES, Riverside County, Cu

CALIFORNIA INDUSTRIAL MINERALS CO
Box 148, Friant
Own: Forrest S Taylor
TAYLOR MINE, nr Friant, volcanic ash
150-TON DRY MILL

CALIFORNIA LIMESTONE PRODUCTS
139 S Beverly Dr, Beverly Hills
Pres & Mgr: R S Hall
VP: John Soovajian
Sec-Treas: Maurice Willows, Jr
LANGDON MINE, Box 1084, Blythe, 22 mi NW of Blythe, undergr & surface, Mn
Gen Mgr: R S Hall
Gen Supt: James P Carr
Prod: 300 tons of Mill grade ore

CALIF & NEVADA MERCURY CO
Calistoga
George Marshall, Ernest Ruiz
WALL STREET MINE, Lake County, Hg

CALIFORNIA PLACER MINE
Sailor Flat
Own: Marie & Morton S Martin, 340 Arlington Ave Berkeley 7
Gen Mgr: H T Martin
Geol: Chas S Haley
CALIFORNIA PLACER, 24 mi E of Forest Hill on Forest Hill divide, hydraulic, Au
Mine Supt: M S Martin
Idle

CALIF QUICKSILVER MINES, INC
315 Market St, San Francisco 5
Pres: R F O'Bryan
VP: R P Hasenauer
Sec: H H Hill
ABBOTT MINE, Williams, undergr, Hg
Gen Mgr: C O Reed
Geol: Fred Hanson
Frm: A J White
Prod: 80 tons
50-TON GRAV MILL at mine, rotary mix

CALIF URANIUM CORP (FORMERLY MARIGOLD OIL & MNG ENTER)
7953 Arcola Ave, Sun Valley
Pres: James T Vellinga
VP: Lois J Vellinga
Sec-Treas: Gertrude Cornell
Geol: Joseph M Vellinga
MINE, South Fossil Bed, north Barstow, undergr, uraninite, Cu
Under devel

CALIVADA DEVEL CO, INC
Box 4, Garden Valley
Pres & Gen Mgr: Hal T Hall
VP: Louis R Ball
Sec & Asst Gen Mgr: E S Hall, Jr
Elec Eng: Edmund Cheek
Gen Supt: R A Hathaway
Mech Eng: Frank Böttcher
EL DORADO COPPER MINE, 12 mi W of Placerville, undergr, Cu
Under devel
100-TON FLOT MILL

CALRADO DEVEL CO
190 S Beverly Dr, Beverly Hills
Co-Part: R S Hall & Maurice Willows, Jr
BLACK JACK-ARLINGTON MANGANESE MINE, 13 mi NW of Blythe, surface & undergr
(leased to Blythe Manganese Co)

CAMPION, IVAN H
Somerset via Coles Station
IRISH SLIDE MINE, 23 mi SE of Placerville, undergr, placer, Au, Ag
Idle

CARDINO, INC
1027 W 19th St, Santa Ana
JUPITER MINE, San Bernardino County, Au

CASTELLA MNG & MLG CO
320 Market St, San Francisco 11
LAMBERT MINE, Butte County, Cr_2O_3

CASTLE, E C
Box 139, Bishop
WHITE CAPS MINE, Inyo County, WO_3
Idle

CASTRO MNG CO
1819 San Luis Dr, San Luis Obispo
Gen Part: D A Hall, Geo I Barnett
CASTRO CHROME MINE, open pit, Cr
Prod: 75 tons
CONCEN, San Luis Obispo

CBM TUNGSTEN MNG CO
Box 4118, Fresno
Pres: Charles E Marsh II
SWAMP LAKE MINE, Dabney Creek, undergr, scheelite
Mgr & Geol: Neil B Stever
Supt: Lloyd Gilbert
Prod: 50 tons
Under devel
50-TON GRAV MILL, Grouse Lake

CHALLENGE MNG CO
727 Shasta St, Redwood City
CHALLENGE MINE, San Mateo County, Hg

CHAMBERLIN, CHARLES
Box 24, Johannesburg
OK GROUP, Kern County, undergr, Au
Idle

CHAPMAN & SONS
Junction City
CHAPMAN & FISHER PLACERS, Trinity County, hydraulic, Au
Supt: G P Chapman
Idle

CHLORIDE CLIFFS MINE
Beatty, Nev
MINE, Inyo County, undergr, Au, Pb
Idle

CHOWCHILLA DREDGE CO
Box 348, Whittier
CHOWCHILLA MINE, Madera County, placer, dredge, Au
Idle

CITY BLUE GRAVEL MINE
Box 206, Redding
Off: H G Hampton, R H Cochran, Donald Fiaylinsen
MINE, 1 mi W of Redding, undergr, Au
25-TON FLOT MILL
Idle

CLARK, CHARLES A
P O Box 41, El Dorado
OPHIR LODE, Mother Lode dist, Au, Ag
Idle

CLARK BROS
Star Rt, Box 32D, Folsom
PINE KNOLL MINE, West Belt dist
Au, Ag
Idle

CLIMAX MOLYBDENUM CO
Golden, Colo
CROWN POINT GROUP, Madera County, Cu
(See Colo, NY, Pa)

COLEMAN, CARLTON
c/o Nimshew State, Chico
COLEMAN PLACER RANCH, Butte Creek dist, Au, Ag
Idle

COLUMBIA-SOUTHERN CHEM CORP-(Subsid of PITTSBURGH PLATE GLASS CO)
St, Gateway Center
Pittsburgh 22, Pa
PLANT, Bartlett, Owens Lake dist, borax
Plant Supt: Carl P Budke
Idle

COMMODORE GOLD, INC
Box 208, Yreka
COMMODORE MINE, Siskiyou County, Au

COMSTOCK QUICKSILVER CO, LTD
527 California St, San Francisco
CLOVERDALE MINE, Sonoma County, Hg

CONSOL MANGANESE CORP
300 Montgomery St, San Francisco
MINE, Sonoma County, Mn
Idle

CONSOL NICHOLSON MINES
Vancouver, B C
BLUE LODGE MINE, Siskiyou County, Au

CONTINI BROS
Box 183, Jackson
Pres & Gen Mgr: Nick Contini
VP & Asst Gen Mgr: Bert Contini
CONTINI THREE HORSEMEN, IXL MINES, 7 1/4 mi E of Jackson on Hiwy 88, undergr, Au, Ag
Idle
STAMPMILL, Irish Town
Mill Supt: V Garbarini
Assay: Marc Hanna

E B COOK CO
1063 Howard St, San Francisco 3
PERMIT MINE, Mariposa County, Au

COPPER QUEEN MNG CO
c/o Miles W Edghill, President
1331 "T" St, Sacramento
COPPER QUEEN GROUP LODE, Sawpit Flat dist, Cu, Au, Ag
Idle

CORDERO MINING CO
131 University Ave, Palo Alto
VP: S H Williston
Gen Mgr: J Elden Gilbert
MAY LUNDY MINE, Mono, 10 mi W of Mono Lake, Au
Idle
QUIEN SABE MINE, Hollister, 19 mi E of Hollister, undergr, Hg
Idle
Gen Supt: Herbert Mitchell
(See Idaho, Nevada, Oregon)

CORONADO COPPER & ZINC CO
523 W 6th St, Los Angeles 14
Pres: Geo D Dill
VP: H T Mudd
(See Arizona)

CRABTREE & SULLIVAN
Jackson
MINE, Amador County, Mn
Idle

CRAIG, BERT
Box 6, Essex
CRAIG MINE, San Bernardino Co, WO_3
Idle

CRAIG, MRS C H
2487 Portola Way, Sacramento
PERKINS GRAVEL CO PLANT
American River dist, placer, Au, Ag
HAGGIN GRAVEL PITS &
DEL PASO GRAVEL PITS,
Folsom dist

CRAWFORD, G
Bishop
BROOKS MINE, Inyo County, WO_3
Idle

CRAWFORD, LOWELL V & COOK, JOSEPH W
Trona
PADDY'S PRIDE LODE, Confidence dist, Pb, Ag, Au
Idle

CROTSENBERG, S D
Kernville
BRUSH CREEK MINE, Kern County, WO_3
Idle

CRUMPTON, VICTOR
Happy Camp
MINE, Siskiyou County, Au, Ag
Idle

CRYSTAL BALL MNG CO
21860 Bertram Rd, San Jose
NEW ALMADEN MINE, Santa Clara County, Hg

CRYSTAL CAVE MNG CO
Box 782, Las Vegas, Nev
CARBONATE KING ZINC LODE, Ivanpah dist, Zn, Au, Ag, Pb
Idle

CUMMINGS, M L
3041 Montgomery Way, Sacramento
FRIENDLY GROUP, Sawpit dist, placer, Au, Ag
Idle

CUMMINGS, THOMAS M
Denny
MANZANITA PLACER MINE, New River dist, Au, Ag
Idle

CUMMINGS - ROBERTS
730 N Highland Ave, Los Angeles 38
Gen Part: H Evan Roberts
(See Nev)

CYCLONE GAP MINE
Box 475, Grants Pass, Oreg
Lessees: Wm S & Ruth Robertson & Assoc
MINE, Siskiyou County, 30 mi S of O'Brien, Oreg, undergr, Cr
Mine Supt: W S Robertson
Asst Mine Supt: A E Ekstrand
Prod: 10 tons daily

CYPRUS MINES CORP
1206 Pacific Mutual Bldg, Los Angeles 14
Pres: H T Mudd
VP: A R Thomas
VP & Treas: H S Nye
Sec: L A Garrett
Purch Agt: W F Stover
(See Ariz, Colo)

D & D MLG CO
1106 W Isabel St, Burbank
DEL NORTE MINE, Inyo County, Au
INYO GROUP, Inyo County, Au

DAKIN CO
2811 Hillside Dr, Burlingame
Pres: Fred H Dakin
VP: Wesley W Keegan
Sec: Henrietta Dakin
UNCLE SAM MINE, 10 mi NW of Central City, Shasta County, undergr, Au, Cu, Zn, Ag
Idle

DARMOND MNG & SMELT CORP
Box 316, Rosamond
BERTHA ANN GROUP, Inyo County, Ag

DARNELL, BECKER & CO
Box 813, Encinitas
CAP HUNTER MINE, Riverside County, Ag

DAVIES, TOM
Caliente
JUAN DOSE MINE, Kern County, undergr, Au, Ag
MINNIE ELLEN MINE, Tulare County
P & D LODE, Agua Caliente dist, Ag, Au
Idle

DAVIS, CLINTON F
Box 32, Greenwood
C B DAVIS PROP (McGRUBB) LODE, Mother Lode dist, Au, Ag
Idle

DAVIS, RICHARD D
1144 11th St, San Bernardino
COPPER CRYSTAL LODE, Slate Range dist, Pb, Ag, Cu, Zn
Idle

DAVIS, ROBERT E
Rt 2, Box 2695, Sacramento
BRIGHTON SAND & GRAVEL PLANT, Folsom dist, Au, Ag

DAVIS, W G
1848 103rd Ave, Oakland
REDCAP GROUP, Orleans dist, placer, Au, Ag
Idle

DAVIS MNG CO
Rt 1, Box 158, Santa Maria
DAVIS MILL, Santa Barbara County, Cr_2O_3

DEAD TREE MNG CO
Box 644, Pedro Valley
Pres: Jack R Roberts
DEAD TREE MINE, Tulare County, undergr, WO_3, U_3O_8
Geol: William Lewis
Under devel

DEATH VALLEY PANAMINT MNG CO
Box 134, Baker
Pres: Ellis O Baker
TELEGRAPH MINE, Inyo County, Au

DELL OSSO GOLD MNG CO
Box 3439, Terminal Annex, Los Angeles 54
DELL OSSO LODE, Talvord mng dist, Au, Ag, lime, garnets & silica
Idle

DEL MONTE PROPERTIES CO, SAND DIV
Box 190, Pacific Grove
Pres: S F B Morse
Plant Mgr: H H Bein
Sales Mgr: P C Valentine
Metal: Henry Benech
Gen Supt: C J Houseman
MINE, Del Monte Forest, Pebble Beach, surface, glass sand, quartz, feldspar, gr sand
Prod: 800 tons
800-TON FLOT MILL

DELTA MNG CO
2728 H St, Merced
Op: F S Herring
JESSE BELLE MINE, Madera County, Cu

DIATOMIC CHEM PRODUCTS CO, INC
1516 Industrial St, Los Angeles 21
Pres: Charles L Seymour
VP: Carmen Esposito
Sec-Treas: John F Atwill
Purch Agt: O Langston
DIATOMIC MINE, Hwy 1, Lompoc, open pit, diatomite
Gen Supt: D B Stephens
Prod: 30 tons processed calcined
2,000-TON MILL, Lompoc

DICKEY EXPLOR CO
Alleghany
ORIENTAL LODE MINE
Gen Mgr: Donald B Dickey
Geol: W Fuller
Undergr, Au, Ag
Idle
75-TON FLOT-GRAV MILL, at mine
Assay: Abott Hanks

DILTZ ORO GRANDE MNG CO
414 21st St, Merced
Op: J J Pulham
MINE, Mariposa County, Au
Idle

DOBBINS, D A & ASSOC
1106 W Isabel St, Burbank
BRONZE MINE, San Bernardino Co, WO_3
Idle

DONAHUE, LYLE
Oasis via Big Pine
TARGET GROUP LODE & MILL, Deep Springs dist, WO_3
Idle

DONNER, H L
Milton via Parmington
DONNER & LOST LOG MINES, Calaveras County, Au
Idle

DOSCHER, CHARLES, VISCOVICH, V & MILOESVICH, STEVE
Pine Grove
JUMBO LODE, East Belt dist, Au, Ag
Idle

DOUBLE O TIMBER & MNG CO
390 Davis St, San Francisco 11
VP: Hans Hammer
Sec-Treas: Albert S Simrak
DOUBLE O MINE, 50 mi NE of Auburn, placer, Au
Idle

DRY ORE CONCENTRATOR, INC
Box 743, Yreka
VP & Gen Mgr: Austin C Putnam
OSGOOD MINE, Siskiyou County, Au, Cr_2O_3, Mn

EARLY MORNING MNG CO
1185 Monterey St, San Luis Obispo
EARLY MORNING MINE, Fresno County, Cr
Idle

EAST RIDGE CO
833 Shasta Place, Los Angeles 5
Pres: C E Byrne
VP: F Moldenhauer
Sec: Alice Davenport
(See Colo)

EASTER SUNDAY MNG, INC
1202 Mark Twain Ave, Reno, Nev
MINE, Lassen County, Au

EDGECUMBE EXPLOR CO
281 S Hudson, Pasadena 5
Pres: Mrs Charlotte Morgan
VP: C A Haley
Sec: Arnold Hulden
Treas & Gen Mgr: G H Morgan
(See Alaska)

EDMONDS, W H & VERA O
Raymond
VERA O PLACER, Au, Ag, ilmenite, Zr, Ti, Os, WO_3
Idle

ELDER CREEK MNG CO, INC
2700 19th St, San Francisco
ELDER CREEK, GRAU, KLEINSORGE, SOUTH ELDER, Tehama County, Cr_2O_3

EL DORADO LIMESTONE CO
Shingle
Pres: J H Bell
VP: E G Schnell
Gen Mgr: C R Nichols
Sec: H P Armes
Mech Eng: Paul Ransom
LIMESTONE MINE, 4 1/2 mi SW of Shingle Springs, undergr, limestone
Mine Supt: P G De Berry
Prod: 800 tons
MILL, Crushing, Washing, Screening

EL DORADO-PLUMBAGO MINES CONS, INC
211 Octavia St, San Francisco
EL DORADO-PLUMBAGO MINE, Sierra County, Au

EMPIRE STAR MINES CO, LTD
Grass Valley
VP: Carrol Searls
EMPIRE STAR MINE, Grass Valley, undergr, Au, Ag
Gen Mgr: H R Fitzpatrick
Asst Gen Mgr: P L Wilson
Metal: George Larsen
Elec Eng: A Brass
Mech Eng: Phil Keast
Safety Eng: C H Plumtree
Mine Frm: E Brokenshire, W Wales
Mine Eng: P Jolley
Ch Eng: M White
400-TON FLOT-CYAN MILL
Mill Frm: A Dowdell, C Edwards
Assay: William Weil
RETORT FURNACE
(See NY)

ENDURANCE MINING CO
(Leasing Tightner Mines Company operation)

ENGEL, RENE & ASSOC
P O Box 68, Wofford Heights
PALA, BIG RAYMOND, B & F, LAST CHANCE MINES, Kernville & Weldon dists, Kern County, undergr, WO_3
Gen Mgr: Dr Rene Engel
Gen Supt: H H Lee
Gen Frm: Earl Pearce
Prod: 50 tons
50-TON GRAV MILL, Weldon

FAIR OAKS GRAVEL CO
4000 Illinois Ave, Fair Oaks
GRAVEL PLANT, Sacramento County, Au

FAIRBANKS, L D
Box B, Daggett
DONNA LOY MINE, Inyo County, talc
Idle

FAIRFIELD MNG CO, INC
831 E Main St, Stockton
Pres & Purch Agt: LeRoy A Washburn
VP: Ray Julius
Sec & Treas: P M Locaccini
(See Idaho)

FAIRVIEW PLACERS
Lewiston
(joint venture of Sunshine Mng Co & The Idaho Canadian Dredging Co)
Own: Rep & Gen Mgr: H B Murphy
Purch Agt: A D Soule
PLACER, 10 mi N of Lewiston, 8,000 yd bucket dredge, Au, Ag
Supt: H C Young

FERNANDEZ, FRANK C
1326 Pine St, Santa Monica
Gen Mgr: George Greve
MONO PIUTE RAINBOW MINE, 16 mi NE of Bishop, undergr, surface, Au, Ag, Pt
25-TON GRAV MILL, Pinin Canyon
Under devel
(See Sunday Mng Co, Nev)

FIDELITY MINE
Columbia
Mgr: Wayne Stebough
MINE, Au, Ag
Supt: Vernon Ray
3-TON GRAV MILL
Idle

FIDELITY MNG CORP
10535 Buford Ave, Inglewood 2
Own & Pres: L Mills Beam
TEMPLE MOUNTAIN MINE, undergr, U_3O_8

FIPE, E J & E M
Star Rt, Box 738, Lucerne Valley
BUCKHORN LODE, SW of Lucerne Valley, surface, Au, Ag
Idle
HIGH POINT LODE, NE of Lucerne Valley, undergr, Au, Ag
Idle

FILLIER, EARL J
Coarse Gold, Madera County
GOLDEN RIBBON, TEXAS FLAT, & KLICKITY KLICK GROUP LODES, 1 mi N of Coarse Gold, undergr, Au
Idle

FITZGERALD, SMITH & ASSOC
Box 586, Placerville
COPPER HILL MINE, Amador County, Ca

FITZHUGH & OSBORN MNG CO
P O Box 238, Tempiemus
LA LIBERTAD MINE, San Luis Obispo County, Hg

FLEDDERMAN, A G
403 Butte St, Yreka
FLEDDERMAN MINE, Yreka dist, placer, Au, Ag
Idle

FOOD MACHINERY AND CHEMICAL CORP, WESTVACO MIN PROD DIV
Box 337, Newark
Res Mgr: R F Moran
Asst Res Mgr: D C Linton
Oper Supt: S M Cimino
WESTVACO MINE, Box 941, Hollister, surface, dolomite
Prod: 500 tons
Mine Supt: R Swindlehurst
500-TON MILL, Hollister
Mill Supt: R Swindlehurst
Assay: Norman Cusha

FOREMAN & FOREMAN
Box 175, Darwin
Pres: L D Foreman
Gen Mgr: R L Foreman
DEFENSE MINE, 11 mi S of Panamint Springs, undergr, Pb, Ag

FRIDAY NICKEL SYNDICATE
3125 Wilshire Blvd, Los Angeles 5
Pres: D B MacAfee
VP: Dudley Cornell
Sec: Saul J Bernard
Treas: Marvin L Tregerman
Tech Dir: M W Macafee
FRIDAY NICKEL MINE, Julian, undergr, Ni, Co, S
Under devel

FRYE, HERVEY V
c/o Inskip Inn, Stirling City
MONEY MUSK MINE, Butte County, open pit, placer, Au
Idle

GALCONDA METALS DEVEL CORP
Box 365, Lancaster
GOLDEN BUDDA MINE, Kern County, Au

GAMBLE, GEORGE
1431 Waverly St, Palo Alto
KNOXVILLE MINE, Napa County, Hg
Idle

GARCIA, MARINO & KINSELA
Middletown
JAMES CREEK PLACER, Napa County, Hg

GARIBALDI BROS
Volcano
GARIBALDI MINE, Amador County, Au
Idle

GARNET DIKE MINE
King River Hatchery, Fresno
MINE, Fresno County, WO_3

GENERAL DREDGING CO
Natoma
Part: Giddings, Haines & Boucher
PLACER, 2 mi from Folsom, dragline, Au, Ag
Idle
GENERAL DREDGE #2, American Riv Dist, placer, Au, Ag, Pb
Idle

GENERAL MNG CORP
8272 Sunset Blvd, Los Angeles
Pres: E J Speaks
VP: Don Carty
Sec: Allan Thody
Treas: Howard Mallring
(See Ariz)

GHEZZI & HARRY
154 Tunstead Ave, San Anselmo
LAZAR LODE, Mother Lode dist, Au
Idle

GIBRALTER MNG CO
15516 Lakewood Blvd, Paramount
GIBRALTER GROUP, Santa Barbara County, Hg

GILES, JOSEPH P
11371 S Stelling Rd, Cupertino
HUMMINGBIRD MINE, Shasta County, near Redding, undergr, Au
GRAV-AMAL MILL, at mine

GILES BROS
Frederick H & Daniel A Giles, Alleghany
GENERAL SHERMAN, SPOOLIN LODES
Idle
GOLD CROWN LODE
(See Gold Crown Mng Corp)

GIPSY MINE & MILL CO
9075 Glenoaks Blvd, Sun Valley
Pres & Gen Mgr: J H Bennett
Sec-Treas: A E Bennett
MINE, Sun Valley, open pit, WO_3, Au
Under devel
80-TON FLOT-GRAV MILL, Bakersfield

GLADDING, McBEAN & CO
3901 Los Feliz Blvd, Los Angeles 39
Pres: C W Pisanjo
Sec: R A Eccles
Treas: E M Dundas
PLANTS, Corona, Ione, Lincoln, Pittsburgh, South Gate
MINES, Amador, Inyo, Kern, Los Angeles, Orange, Placer, Riverside, San Bernardino & Yuba Cty s
(See Washington)

GLENN CO
3134 E 10th St, Oakland 1
Own & Gen Mgr: George G Glenn
Gen Supt: Harry Odgers
MARBLE SPRINGS MINE, 12 mi E of Colliterville, undergr, Au, Ag, Pb
50-TON FLOT MILL
Mill Supt: Frank Lane
Idle

GLIDDEN CO, THE
Box 1430, Redding
Pres: Dwight P Joyce
VP: John P Ruth
Sec: R D Horner
BULLY HILL & RISING STAR MINES, Shasta County, undergr, Cu, Zn, Au, Ag
Gen Mgr: Edward L Ralston
Supt: Donald Odell
Frm: Louis Ginino
Eng: John X Murphy
Under devel

GLOBE URANIUM, INC
1888 N Crescent Heights Blvd, Los Angeles
HORN GROUP, San Bernardino County, Cu

GOLD HILL DREDGING CO
311 California St, San Francisco
Pres & Gen Mgr: J J Coney
Sec: L R Kerdell
Asst Sec & Mgr: H S Gilbert
Purch Agt: E O Perkins

PLACER PROP on Mokelumne Riv in San Joaquin County, Feather Riv in Butte County bucketline, Au, Ag
Supt: H L Coney
Idle

GOLDEN BEAR MINE
495 N Bowling Green, Los Angeles 49
Pres: Ervin J Dear
MINE, Ord Mts, 15 mi N of Lucerne, undergr, surface, U_3O_8, Th, Ag, Au
Under devel

GOLDFIELD CONS MINES CO
1 Montgomery St, San Francisco
Exec VP: Willis A Swan
OMEGA MINE, Nev County, hydraulic, Au
Idle
(See Nev, Wash)

GONZALES, PAUL
1490 Ford Ave, San Jose
WONDER MINE, San Benito County, Hg
Under devel

GOOD HOPE MNG CO
120 "O" St, Fresno
Pres & Gen Mgr: J H Lougheed
MINE, 30 mi E of Visalia, undergr, WO_3
Gen Supt: R Johnson
Prod: 50 tons
25-TON GRAV MILL
Mill Supt: R Johnson

GOODHUE, J W
Taylorsville
PILOT MINE, Genesee, Plumas County, surface, undergr, Au, Ag, Cu
Under devel

GORDON, L I
6742 1/2 Kraft Ave, North Hollywood
ORE HILL GROUP LODE, Los Angeles dist, undergr & placer, Au, Ag
Under devel

GOSSAM CAP MINE
Box 194, Inyokern
Pres: Mrs. Ralph Griffon
VP: Mrs C W Wheeler
Gen Mgr: C W Wheeler
Gen Supt: R W Griffen
Elec Eng: Ed Kemper
GOSSAM CAP MINE, 1 1/2 mi from summit of Walker Pass, Chalcopyrite, Cu, Au, Ag, V_2O_5
25-TON FLOT-GRAV MILL, at mine

GOULD, H W & CO
709 Union St, San Francisco
Own: Malcolm B Gould
HELEN MINE, 6 mi SW of Middletown, Lake County, Hg
Under devel
(See Klau Mine, Inc)

GRANTHAM MINES
237 N 2nd Ave, Upland
Own: Louise Grantham
Supt: John Odgers
Eng: Richard Franklin
WARM SPRINGS TALC DEPOSIT, Inyo County, Talc
TAYLOR-TREASURE GROUP, Inyo County, Au
RED EAGLE CLAIM, Pb

GREAT LAKES CARBON CORP DICALITE & PERLITE DIV
612 S Flower St, Los Angeles 17
Pres: George Staisi, Jr
VP & Gen Mgr: D L Marlett
Op Mgr: E A Harris
Asst Op Mgr: H V Brower
Purch Agt: Jay Hughes
PLANT #1 (RADAR HILL MINE), Box 107, Walteria, open pit, diatomaceous silica
MILL, Walteria
Supt: A K Muir
Asst Supt: Carl F Schaholz
Frm: Orval Chance
Ch Chem: E L Nau
Ch Eng: D F Dyrsmid
Prod: 4,500 tons
PLANT #3, Box C, Lompoc, 7 mi W of Lompoc, surface, diatomite
MILL, Lompoc
Mill Supt: E D Ingram
Asst Supt: R W Yocum
Frm: Martin Grycsko & John Bradford
Ch Chem: J W Girard
Prod: 6,000 tons
(See Gr Lakes Carbon Corp, Colo, Nev, N Mex, Oreg)

GREAT LAKES OIL & CHEMICAL CO
417 S Hill St, Los Angeles 13
Pres: Charles S Hale
Sec: Richard E Bishop
Treas: John R Atkins
KERGON MINE, Miracle Hot Springs, undergr, U_3O_8
Gen Mgr: G Austin Schuster
Under devel
(See Kergon Mng Co)

GREEN, SHERWOOD
210 S "D" St, Madera
ACE PLACER, Madera County, Au
JENSEN PLACER, Friant dist, Au
Idle

HAMPTON MNG CO, CHROME DIV (Subsid of CONSOL VIRGINIA MNG CO, Nevada)
2745 S LaFayette Park Place, Los Angeles
Treas: T E Wilson
SAWMILL CREEK MINE, San Benito County, open pit
Gen Mgr: Joseph R Holman
Gen Supt: Jack M James
Prod: 50 tons
100-TON MILL
Mill Frm: Don Shing

HARMON & DOZIER MNG CO
Box 963, Mariposa
BELLY KABO MINE, Mariposa County, Au

HARPER, J L
Patrick's Creek Inn, O'Brien, Oreg
ELK CAMP MINE, Del Norte Co, Cr
Idle

HARRIS, MICHAEL
c/o Furnace Creek Ranch, Death Valley
KEANE WONDER EXTENSION LODE, Chloride Cliff dist, Au, Ag
Idle

HAZEL CREEK MNG CORP
Box 3508, North Sacramento
Pres, Gen Mgr & Purch Agt: Richard Romeo
VP: J Dickson Smith
Sec-Treas: Edwin Wilder
HAZEL CREEK MINE, Box 297, Pollock Pines, 6 mi SE of Pollock Pines, undergr, Au, Ag, Pb, Zn
Mine Supt: John Coonce
Asst Supt: Martin Humbird
Elec Eng: Carl Weyel
Prod: 50-100 tons
FLOT-MILL, Hazel Valley
SMELTER, Selby

HEATHER, HARRY F
236 S Oak Knoll Ave, Pasadena
BRIGHT OUTLOOK MINE, San Bernardino County, WO_3, Au
Under devel
6 DAUGHTERS MINE, Needles, undergr, U_3O_8, carnotite
OVERSITE MINE, Amboy, open pit, pumice
Under devel

HELEN MNG CO
1215 Michigan St, San Francisco
HELEN MINE, Lake County, Hg

HELMKE, THOMAS & JANSSEN
24 California St, San Francisco
LAMBERT, LITTLE CASTLE CREEK, COSTA, CROW CREEK, FOREST QUEEN MINES, undergr & open pit, Cr
Gen Mgr: O A Fulghum
Mine Supt: Verl Price
Mine Frm: C A Barton
150-TON GRAV MILL, Castella
Mill Supt: C R Robinson

HERBERT, O A
Box 67, Plymouth
WOLIN PROPERTY, Mother Lode dist, placer, Au
Idle

HERBERT MINES
Rt 5, Box 180A, Porterville
TUNGSTEN MINE, Tulare County, WO_3
Idle

HIGH NOON MINE
Furnace Creek Ranch
Op: Ralph S Dahl
MINE, Wildrose dist, undergr & surface, scheelite
Idle

HILLEN HOLDING MNG CORP
19 Campo Bello, Menlo Park
Pres: Wm C Holding
VP: P C Hillen
Sec: Keith Petty
Treas: Keith Garner
SONORA URANIUM MINE, Mono County, undergr, open pit, U_3O_8
Gen Mgr: W C Holding
Supt: P C Hillen
Prod: 20 tons

HILLTOP TUNGSTEN MINE
Sanger, c/o E G Perun, Trimmer Rt, Maxon's Store
MINE, 10 mi E of Trimmer, undergr, WO_3
Idle

HOLDING MINE & DEVEL CO
19 Campo Bello, Menlo Park
Pres: Wm C Holding
VP & Gen Mgr: P C Hillen
SHOESTRING TUNGSTEN MINE, Mono County, Tioga Pass near Lee Vining Canyon, undergr, WO_3, Mo
Under devel

HOLMAN, J R
1465 E Orange Grove Ave, Pasadena 7
BONNELL STATE LEASE, Coalinga, open pit, Cr
Gen Mgr: J R Holman
Asst Gen Mgr: R A Pimbott
Supt: Richard Wilder
Prod: 50 tons
MISTAKE MINE, 25 mi W of Coalinga, open pit, Cr
Idle
40-TON GRAV MILL, White Cr
Supt: F W Wilder, Jr

HOLMESTAKE MNG CO
Box 306, Winterhaven
Pres & Gen Mgr: K A Holmes
Asst Gen Mgr: Lee Hardy
CARGO MUCHACHO GROUP, Imperial Co
Idle
CASTLE DOME FLUORSPAR, Imperial Co
125-TON FLOT MILL, 4 mi W of Winterhaven
Mill Supt: James G Hardy
Assay: Harvey Hardy
(See Arizona)

HOMESTAKE MNG CO
100 Bush St, San Francisco
Pres: Donald H McLaughlin
VP: Guy N Bjorge
VP-Treas: Archibald A Gulick
VP: James W Sweet
Sec: John W Hamilton
Asst Sec: Wm W Murray
(See So Dak, Utah, Wyo)

HONOLULU MNG & DEVEL CO
PO Box 13, Trona
c/o W Lee Willett
HONOLULU MINE, Inyo County, Ag

HOPE SO MINE
c/o R W Leslie, 2119 Eureka Way, Redding
MINE, undergr, Au, WO_3
Gen Mgr: R W Leslie
Idle
25-TON JIG MILL

HUNTLEY INDUSTRIAL MINERALS INC
Box 305, Bishop
Pres: W H Huntley
VP: D T Davis
Sec-Treas: Cecile M Huntley
COLTON MINE, 20 mi NE of Bishop, open pit, pyrophyllite
LAWRENCE MINE, 5 mi S of Tin Mountain in Ubehebe Range, open pit, asbestos
PACIFIC PYROPHYLLITE MINE, 20 mi N of Laws, open pit, pyrophyllite
TUNGSTEN CITY TUNGSTEN MINE 7 mi W of Bishop, open pit & undergr, WO_3
HUNTLEY TALC MINE, 43 mi SE of Big Pine, undergr & open pit, talc
Prod: 20 tons
HUNTLEY NON-METALLIC MILL: Laws, talc, pyrophyllite, mica feldspar, clays
Prod: 6,000 tons per month
(See Ariz)

IDAHO MARYLAND MINES CORP
Box 1038, Grass Valley
Pres & Gen Mgr: Bert C Austin
VP & Asst Gen Mgr: Max Bechhold
Sec-Treas: C L Allan
BRUNSWICK MINE, 2 1/2 mi NW of Grass Valley, undergr, WO_3, Au, Ag
Prod: 40 tons WO_3, 20 tons Au
750-TON FLOT MILL, Grass Valley
Mill Frm: Oliver Peterson
(See Utah)

IGO MINING CO
Box 1413, Redding
Pres: R B Tupper
Gen Mgr: M E Hawe
BIG WYKE MINE, Ig, Au, Ag, Pb, Zn
YANKEE JOHN MINE, Au, Ag, Pb
Idle

INDUSTRIAL MINERALS & CHEMICAL CO
6th and Gilman Sts, Berkeley 10
Pres: L R Moretti
VP: W S Cowgill
Sec-Treas: A L Forbes
SPANISH MINE, Nevada County, barite
Idle
MILLS, Berkeley and Floris, non-metallic
Mill Supt: Forrest Rhoton
(See Nev)

INTERNATL METALLURGICAL CHROME CORP
1026 Chorro St, San Luis Obispo
Pres: S J Herman
VP: G Bartol
Gen Mgr: W B Armes
Sec: Leo B Lebovitz
NORCROSS MINE, 8 mi NW of San Luis Obispo, surface, Cr
Under devel
150-TON GRAV MILL
Frm: H J Prouty

INYO MARBLE CO
4708 N Muscatel Ave, Rosemead (Expc office), 736-738 E 28th St, Los Angeles 11
Pres & Treas: D H Dunn
VP: L R Glover
Sec: C A Cravens
CONSOL INYO PROPERTIES, Dolomite via Lone Pine, surface, marble, limestone, dolomite, quartzite
Gen Mgr: D Haven Dunn
(Quartzite properties leased to Gladding, McBean & Co and General Refractories)
(Marble & dolomite leased to Lone Pine Company)

INYO SOIL SULPHUR CO
310 Pacific St, Bakersfield
CRATER CLAIMS, Inyo County, S
Idle

IRELAN YUBA CO, LTD
1921 Stockton Blvd, Sacramento
IRELAN MINE, Sierra County, Ag

ISBELL CONST CO
Box 2251, Reno, Nev
BORAX MINE, open pit,
Contract mng for Pacific Coast Borax Co
Supt: Arnold Blair
(See Nev, Utah, Wash)

J & W MINING CO
Corvallis, Oreg
Pres: Norman Johnson
Sec-Treas: Chas S Wilson
TYSON CHROME MINE, Gasquet, 20 mi NE of Crescent City, undergr, surface, Cr
Supt: William Whipps
Cons Eng: K O Watkins

JANZEN, PETER
Gasquet
CHROME HILL, ELK CAMP, Patrick's Cr, Butte County, Cr

JOHNS-MANVILLE PRODUCTS CORP
Lompoc
Gen Mgr: O B Westmont
Asst Gen Mgr: G G Schuknecht
MINE, Lompoc, surface, diatomaceous silica
Quarry & Mines Supt: C W Spher
Asst Supt: E W Hodges
Gen Frm: O C Benedict
Eng: D E Neuschwander
MILL, at mine
Mill Supt: G W Porter
(See NY)

WALTER W JOHNSON CO
Dollar Bldg, San Francisco, Calif
(See Brinker-Johnson Co, Alaska)

JOUBERT PLACER MINE
Sawyers Bar
Own: Louis J Joubert
HYDRAULIC PLACER, Au, Ag
(Leased by Strawacher & Hartnett)
Idle

JUDGE HYDRAULIC MINE
Sawyers Bar
PLACER, Siskiyou County, Au
Idle

JUNIPER MINE
Box 6, Baker
Own: Thomas F Curtis
MINE, San Bernardino County, undergr, surface, fluorspar
Under devel

K P F & F MNG CO
Box 1, Igo
TROUT CREEK, BARRY CREEK, BLACK BEAR, LUCKY SUNDAY MINES, Trinity County, Mn

KAISER ALUMINUM & CHEM CORP
1924 Broadway, Oakland 12
Pres: Henry J Kaiser
VP: D A Rhoades
Sec: Wm Marks
Treas: Donald Browne
Purch Agt: Duncan Gregg
Mgr, Chem Div: F M Cashin
Geol: E A Hastan
NATIVIDAD PLANT, Box 1511, Salinas
Works Mgr: J F Knight
Gen Supt: D M Kerr
Asst Gen Supt: Wm Burns
Plant Supt: Ivan Hall
Mech Eng: J E Winter
HEAVY-MED MILL, Natividad

KAISER STEEL CORP
1924 Broadway, Oakland 12
Pres & Chmn of Bd: Henry J Kaiser
VP & Gen Mgr: Jack L Ashby
VP & Sec: William Marks
VP & Treas: Atwood Austin
Gen Purch Agt: G W Kelly
EAGLE MOUNTAIN MINE, Box 158, Eagle Mountain, surface, Fe
Mine Mgr: Martin J Hughes
Mine Geol: R W Brummett
Mine Frm: W A Horton
Mine Eng: C E Davis
Master Mech: C A Scott, Jr
15,000-TON MILL, ss mine, heavy media & jigging
Mill Supt: C W Rose
Benefic Plant Frm: R P Wennell
Night Shift Benefic Frm: J D Hill
BLAST FURNACE, 1, 214,000-ton capacity, Fontana
Supt: J D Saueressig
Asst Supt: H B Hastings
Works Mgr: B N Dugan

KBANE EXTENSION MNG CO
Box 234, Beatty, Nev
Own: Michael & James Harris
MINE, Death Valley, Inyo County, undergr, Au, Pb, Fe, Ag
Idle

KELLY, T C
Hayfork
KELLY MINE, 5 mi NE of Hayfork, undergr, Au, Ag
Idle

KENNEDY MINERALS CO INC
2550 W Olympic Blvd, Los Angeles 23
Pres: John J Kennedy
VP: A F Escober
Sec: Paul H Wayte
Treas: Fred L Clover
ECLIPSE, Inyo County
TALC AND DEATH VALLEY, Inyo County

KERGON MNG CO
328 Naylor, Taft
Own: Jack I Kerns
W T Waggoner
KERGON MINE, Box 0, Star Rt, Kernville, undergr, U_3O_8
(Oper by Great Lakes Oil & Chem Co)

KEYSTONE COPPER CORP
Box 7, Nevada City
MINE, Nevada City, Au, Ag
Idle

KEYSTONE MINE
Agent: H G O'Banion for Martin Ares, Sutter Creek
KEYSTONE LODE, Mother Lode dist, Au, Ag, Cu
Idle

KIMBROUGH, WILLIE A
8804 Compton Ave, Los Angeles 2
SUNRISE #1, #2, #3 & LUCKY BILLIE CLAIMS #1, #2, #3, #4, Oro Grande mng dist, San Bernardino County, Au, Ag, So, Pt
Idle

KING & KING
Box 503, Big Bear Lake
LUCKY 13, 8 mi NE of Oro Grande, undergr, Au
Idle

KING SOLOMON MNG CO, INC
519 E Carson, Las Vegas, Nevada
ARCTURAS MINE, Inyo County
RUSTY PICK GROUP, Inyo County, Ag

KINGSTON LEAD MNG CO
4060 Beverly Blvd, Los Angeles 4
KINGSTON LEAD MINE, San Bernardino County, Pb, Ag
Trustee: Arthur C LeBrun

KLAU MINE, INC
700 Union St, San Francisco
Pres: Malcolm B Gould
Sec-Treas: B A Gould
VIRGILIA & STANDARD MINES, Plumas County, Au
Idle
KLAU MINE, San Luis Obispo County, Hg
Under devel
(See M W Gould & Co)

KNEPPER, L W
Idria
NORTH STAR MINE, San Benito County, surface, Hg
Prod: 30 tons

KOKO WEEP CO, LTD
c/o D M Hodson
634 S Spring St, Los Angeles 14
CARBONATE KING ZINC MINE, San Bernardino County, Zn, Ag

KORFIST, JERRY
Box 75, Baker
ORE FINE MINE, 13 mi E of Baker, undergr, open cut, Au, Ag
Idle

KUBON & JURVA
413 N Emily, Anaheim
RAND MINE, Kern County, Glenville, WO_3
Idle

LA GRANGE GOLD DREDG
1805 Mills Tower, San Francisco 4
Pres: Henry Eichhoff, Jr
Sec-Treas: Jefferson Kosiltile
PLACER, La Grange, dragline, Au Pt, Ir
Idle

LA PURISSIMA MNG CO
c/o Mr Fortini, 14164 Almaden Rd, Los Gatos
NEW ALMADEN, Santa Clara County, Hg

LAKE COUNTY MINERALS INC
2321 Waverly St, Oakland
MINE, Kelseyville, Lake County, S
Idle

LARIO, JOE P
Box 76, New Idria
SAMSON PEAK MINE, San Benito County, Hg
Idle

LEWIS FOOD CO
817 E 18th St, Los Angeles 21
(See Black Bull Mine, Idaho)

LIDDICOAT GOLD MINES CO
Rt A, Box 27, Greenwood
Pres: J L Liddicoat
VP: L O McClain
Sec: Lillie L Liddicoat
GRIT MINE, undergr, Au
Eng: J P Siegfried
Idle
60-TON GRAV FLOT MILL

LIGHT HOUSE M & M CORP
Box 306, Barstow
MINE, San Bernardino County, WO_3
Idle

LINCOLN CLAY PROD CO
Box 367, Lincoln
Pres: M J Dillman, Jr
VP: K S Brown
Gen Mgr & Purch Agt: A S Gulliford
Sec: W J Crosby
MINE, 1 1/2 mi N of Lincoln, open pit, fireclay
Mine Frm: C O Purdee
Prod: 454 tons
25-TON MILL

LIPPINCOTT LEAD MINES
Box 1811, Santa Ana
Own: George Lippincott
LEAD KING MINES, Death Valley, Ag, Pb, Zn
Prod: 50 tons
Supt: Gene Taylor
25-TON GRAV FLOT MILL, furnace
Supt: Neuman Blek
SMELTER, Bennie Claro, Nev

LITTLE JULIA GROUP QUARTZ MINES
Shasta
Own: Eldred M Bisking, R E Bisking, C E Plumb
LITTLE JULIA MINE, Shasta, undergr, open pit, Au
Under devel

LIVE OAK MINES, INC
Rt 4, Box 206A, Sanger
Pres & Gen Mgr: Challener Thompson

VP: Thomas E Jackson
Sec-Treas: L B Thompson
MINE, open pit, titanium, zircon, hafnium, Fe
Met: Victor Jagar
Chem Eng: Samuel Sklarew
Under devel

LO BAR MNG CO
c/o Don R Mulligan
Box 98, Apple Valley
EAGLE NEST GROUP, San Bernardino County, Ag

LOG CABIN MINES CO
421 W 7th St, Los Angeles 14
LOG CABIN MINE, Lee Vining, undergr, Au, Ag
Gen Supt: Frank C Cassidy
Mine Frm: Pete R Mathieu
150-TON AMALGAMATION PLANT, at mine

LONE STAR MINE
Tegus
Own: Wm B Taylor, Lee Barnett
MINE, 2 mi W of Coleville, open pit, WO_3
Supt: Wm B Taylor
Idle

LUCKY BLACK JUNIOR MINE
Baker
Own & Op: Charles B Foster, 160 Eureka St, San Francisco
MINE, 40 mi from Shoshone, surface, Mn
Idle

LUCKY JACK MNG CORP
10536 Buford Ave, Inglewood 3
Pres: L Mills Beam
VP: Harold D Kinsey
Sec-Treas: Bess J Beam
LUCKY JACK MINE, Strawberry Valley, placer, Au, Pt
Gen Mgr & Met: Major Allured

LUCKY S MNG CO
Taylorsville
LUCKY S MINE, Plumas County, Au

MACCO CORP, BARITE DIV
14408 S Paramount Blvd
Pres: John MacLeod
VP: John Robinson
Div Mgr: J D Hawkins
Gen Supt: Harry Parker
Purch Agt: Neil Giebler
BARITE QUEEN MINE, Box 155, Inyokern, open pit, barite
Mine Supt: Clark Everett
Prod: 300 tons
200-TON GRAV MILL, Hwy 395, 6 mi S of Little Lake
Mill Supt: William Paine
(See Western Barium Corp)

MANGANESE KING MINE
Box 241, Parker, Arizona
Own: W Paul Rossum
Op: D R Harryman
MINE, 9 mi W of Parker Dam, surface, Mn
Idle

MARQUIS MNG CO
West Point
c/o James M Marquis
MARQUIS MINE, Calaveras County, Au

MC GUIRE MNG CO
29 Palms
Op: Clyde F McGuire
MISSION MINE, Riverside County, Au

MERCURY MNG CO
P O Box 424, Middletown
BIG CHIEF GROUP, Lake County, Hg

MERZ DEVEL CO
Rt 1, Box 24 1/2, Lincoln
Mgr: Donald G Carter
CANADA HILL MINE, Placer County, Au

MINERAL MATERIALS CO
1145 Westminster Ave, Alhambra
Part & Gen Mgr: C W Dunton
Part: A S Vinnell
Treas: N T Vincent
Purch Agt: C B Hulsey
ATLAS SILICA MINE, Ore Grande, surface, silica quartzite
Gen Supt: Roy Hill
Asst Supt: Lloyd Bellee
Geol: M W Rasmussen
Prod: 200 tons
800-TON MILL, Ore Grande, jaw crusher & rolls
(See Nevada)

MINES CONTRACTING, INC
507 E Willetta St, Phoenix, Ariz
SPANISH GOLD MINE, Mariposa County, Au

MIRACLE MNG CO
(See Wyoming Gulf Sulphur Co)

MOHAWK MINES, INC
Nipton
Pres: Ley Bartholomew
VP: Emerson A Ray
Sec & Gen Mgr: S C Greenwood
Treas: R N Day
MOHAWK MINE, 45 mi S of Las Vegas, undergr, Pb, Ag
Idle

MOLYBDENUM CORP OF AMERICA
Nipton
Gen Mgr: H D Bailey
Asst Gen Mgr: Russell Wood
Met: H S Woodward
MT PASS MINE, 60 mi SW of Las Vegas, Nev, open pit, rare earth metals
Prod: 150 tons
Mine Supt: John Martin
200-TON FLOT MILL
Mill Supt: G H Lee
Assay: Ralph Porter
(See Colo, N Mex, NY, Pa)

MOONLIGHT MINE, A PARTNERSHIP
Coulterville
MINE, Mariposa County, undergr, Au, Ag
Under devel
25-TON GRAV MILL, at mine

MOONLIGHT MINES OREGON LTD
W M Smith, R E Powell & P C Petsch, 15 E St, No Lakeview, Oreg
MOONLIGHT GROUP LODE, Hi Grade dist, Modoc County, Au, Ag
Idle

MORRIS RAVINE MNG CO
Box 7, Oroville
Pres & Gen Mgr: J H Sharpe
VP: Roy A Hundley
Sec: J R Peterson
MINE, 6 mi NE of Oroville, undergr, Au
Idle

MOUNTAIN COPPER CO OF CALIF
230 California St, San Francisco 11
Pres: L T Kett
VP, Op: C W McClung
Sec: Dudley F Miller
Treas: E Greinchen
Purch Agt: S D Dodds
Sales Mgr: M M Stockman
IRON MTN MINE, Matheson, iron pyrites
Ch Eng: R K Barcus
Pit Frm: W H Calhoun
Prod: 500 tons

MT DIABLO MINE
Contra Costa County
MINE, Hg
Idle

MOUNT GAINES MINE
Hornitos
Own: J W Radil, 444 California St, San Francisco 4
MT GAINES MINE, Hornitos, undergr, Au
Supt: J A Siefert
60-TON FLOT MILL
Under devel

MT SHASTA ASBESTOS CO
Mt Shasta
EDDY CREEK MINE, Shasta County, asbestos
Idle

MUGWUMP MNG CO, INC
Forest City, via Alleghany
MUGWUMP MINE, Sierra County, Au

MULTI-MINES CORP
2550 E Olympic Blvd, Los Angeles 23
Pres: John J Kennedy
VP: A F Escober
Sec: Paul H Wayte
Treas: Fred L Clover
DEATH VALLEY TALC MINE, Inyo County, talc
IBEX MINE, Inyo County, clay

NAT'L LEAD CO, BAROID DIV
2404 Danville, Houston, Texas
HECTOR MINE & PLANT, Newberry, undergr, bentonite
Supt: Jack Hereford
MERCED MILL, Merced, dry grinding of baryte
Supt: Lee Bunch
(See Ark, Kans, La, Mont, Mo, Nev, NY, Tenn, Tex, Wyo)

NATIONAL TUNGSTEN CORP
8383 Wilshire Blvd, Los Angeles
Pres: Sol Posner
Sec: M Kaufman
Treas: Paul Hewitt, Jr
TYLER, ROUNSAVILLE, WISSEMAN MINES, 148 N Main St, Porterville, undergr & open pit, WO_3
Prod Eng-Chg of Oper: J Paul Jones
Mine Supt: James Mitchell
Mine Frm: C Moore
Geol: G T McCall
Prod: 100 tons
100-TON GRAV MILL, near Calif Hot Springs
Mill Supt: Glen Wilder
Mill Frm: H West

NATOMAS COMPANY
607 Forum Bldg, Sacramento
Pres & Gen Mgr: R G Smith
VP: Mortimer Fleischhacker, Jr, Raymond W Ickes
VP & Sec-Treas: Chandler Ide
Asst Sec-Treas: Wanda Durkee
Chmn of Bd: R K Davies
Asst Gen Mgr: Cyril Thomas
PLACER MINE, Natoma, 20 mi E of Sacramento, Au
(See Colo)

NELSON MINE
Box 124, Eureka
Op: Dayton Murray
PLACER MINE, 6 mi N of Orleans, Au
Idle

NEW CHAMPION MINING CO
West Point
CENTENNIAL MINE, undergr, Au, Ag, Pb
Supt: H G O'Hanlon, Jr
Frm: Dean Aghotti
FLOT MILL
Supt: R H O'Hanlon
Idle

NEW IDRIA MNG & CHEM CO
Idria
Pres: C Hyde Lewis
Sec-Treas: M A Burgess
QUICKSILVER DIVISION, Idria, San Benito County, undergr, Hg
Div Supt: Wesley Shaddock
Geol: Richard K Linn
Mine Frm: Victor Soia
MILL, at mine
STRAWBERRY TUNGSTEN DIVISION, 1930 Tyler St, Fresno, undergr, WO_3
Div Mgr: Milton C Richardson
(See Colo)

NEW JERSEY ZINC CO
160 Front St, New York 38, N Y
MOUNTAIN KING & ROYAL MINES, Calaveras County, Au
(See Colo, N J, N Mex, N Y, Pa, Tenn, Va, Wis)

NEW PENN MINES, INC
Camp Seco
Pres: R F Playter
Sec: J H Nicholls
Gen Supt: W F Griswold
PENN MINE, 1 mi W of Camp Seco, Cu, Zn, Ag, Pb, Au
Under devel
200-TON FLOT MILL

NEW WORLD EXPLOR, RESEARCH & DEVEL CORP
6547 Aqueduct Ave, Van Nuys
ALLEN MINE, Bodfish, 5 mi S of Bodfish, undergr, U_3O_8
Under devel
(See Colo, Utah)

NONA MNG CO
Hernandez Valley, San Benito
MINE, San Benito, Hg

NORTHWESTERN MINING CO
P O Box 3191, Seattle 34, Wash
Own: Alfred W Peeler
BOULDER GULCH GROUP, 8 mi W of Sawyers Bar, Siskiyou County, placer, Au
Supt: A Everett Miller
Idle

ONTOP MINE
Meadow Valley, via Quincy
Own: H E Fowler
MINE, 3 1/2 mi S of Bucks Lake, undergr, Au, Ag
Under devel
6-TON GRAV QUARTZ MILL

ORIGINAL 18 TO 1 MINE, INC
1611 Russ Bldg, San Francisco 4
Pres: A M Lewis
Sec: Jack Maxfield
MINE, Alleghany, Au, Ag
Gen Supt: C A Bonnett
Frm: W V Van Doren
150-TON CONC & AMAL PLANT
Mill Frm: J B Hunley

ORO FINO CONS MINES CO
Box 422, Auburn
Pres: G A Nagel
Treas: J C Kemppainen
ORO FINO MINE, 4 mi from Auburn, undergr, Au, Ag
Idle

ORTEGA MNG CO
117 Spurgeon St, Santa Ana
Officials: V P Anderson, Earl Prevert
OLD DOMINION MINE, 6 mi W of Elsinore, undergr, Pb, Zn, Ag
Idle

OWL SPRINGS CO, INC
(Joint Venture Group)
2001 W Artesia Blvd, Torrance
OWL HEAD MINE, San Bernardino County, Mn

PACIFIC CLAY PRODUCTS
Box 2178 Term Annex, Los Angeles 54
Pres & Gen Mgr: J D Fredericks
Exec VP: Kenneth Berrette
VP: E M Lawrence
Sec: J C Culhane
Purch Agt: R M DePree
PITS, Amador, Calaveras, Orange, Riverside & San Joaquin Counties, clay & sand

PACIFIC FLUORITE CO OF CALIFORNIA, INC
9813 Flower Ave, Bellflower
Pres & Gen Mgr: James A Grubb
VP & Gen Supt: Sherman M Lineberry
Sec: Ralph R Burrows
Treas: Max H Faller
PACIFIC FLUORITE #3-7, Valley Wells Station, Nipton, Clark Mt mng dist, San Bernardino County, undergr & open pit, CaF_2
Mech Eng: Fred Mitchell
Met: Herb Woodard
Elec Eng: Bill Sterling
Assayer: E Eisenhauer
100-TON FLOT MILL, near mine
Under devel

PACIFIC INDUSTRIES, INC
Box 880, San Jose
Pres: Donald D Smith
VP: John R Plant
Sec-Treas: Ronald Bailey
Purch Agt: Nick Elishovitch
CENTRAL EUREKA MINE, Sutter Cr, undergr, surface, potash, P, V U_3O_8
Gen Mgr: Nick Elishovitch
Geol: Robert E McDonald
(See Colo)

PACIFIC MINERALS CO, LTD
337 -10th St, Richmond
Pres: C L Renwick, Jr
Sec: T H DeLap
PLACERVILLE & SHINGLE SPRING MINES, asphalt, soapstone, slate roofing granuals
Mine Supt: G H Bishop
MILL
Supt: Ed Bishop
MINE, Willits
Supt: Curt Wilson
MINE, Box 566, Eureka
Supt: Don Boughton

PACIFIC MNG CO
1035 Crocker Bldg, San Francisco 4
PINE TREE MINE, Mariposa County, Au

PALO ALTO MNG CORP
521 San Tomas Rd, Campbell
Pres: F H Smith
VP: S S Ridgely, Sr
Gen Mgr: G E Carlson
Sec-Treas: Virgil R Herring
MINES, Santa Clara & Alameda County, undergr & surface, Hg, Cr_2O_3
Mine Supt: S S Ridgely, Sr
Prod: 10 tons
GUADALUPE MINES (Carrillo, Deep Purple, Yellow Jacket, Payne Poison Oak), 14900 Coleman Rd, San Jose 24, Hg
Prod: 125 flasks per mo
50-TON GRAV MILL, 4 mi S of San Jose Coyote Rd
Mill Supt: G E Carlson

PANOCHE VALLEY QUICKSILVER MINES
Box 31, Paicines
LONE OAK & VALLEY VIEW MINES
San Benito County, Hg
Idle

PAYMASTER MNG CO, INC
121 W Main St, Barstow
c/o W L Gabriel
PAYMASTER MINE, Mn

PERLITE INDUSTRIES, INC
Tecopa
Pres & Gen Mgr: Charles H Harrington
VP: Kenneth B Hyseng
Treas & Mgr: William E Hyseng
VP & Mine Supt: W R McGowen
Sec & Mill Supt: Ralph C Harrington
GREY EAGLE MINES #1, 2 & 3
Tecopa, surface, perlite
Asst Mine Supt & Purch Agt: R B Bedeynak
Asst Mill Supt: Charles Waugh
Mill Frm: John Wheat
Mech Eng: Walton R Manuel
100-TON FURNACE

PERMIT MNG CORP
1063 Howard St, San Francisco
PERMIT MINE, Mariposa County, Au

PERON MNG & MLG CO
Piedra
Pres & Gen Mgr: E G Peron
Sec: Mrs Julia Peron
ADIT MINE, Balch Camp via Fresno, 2 1/2 mi NW of Balch Camp on Fence Meadow Rd, open pit, WO_3
25-TON GRAV MILL at mine
L M MINE, near Adit mine, WO_3
Under devel

PHILLIPS, H J
1361 Chase Ave, El Cajon
PHILLIPS MINE, 3 mi SE of El Cajon, undergr, Au, Cu, Pb
AMAL-GRAV MILL
Under devel

PIERCE BROS
595 2nd St, Morro Bay
HARD FACE GROUP, 1 1/2 mi SW of Cerro Alto Lookout, San Luis Obispo County, surface, Cr
25-TON MILL, 8 mi from Morro Bay

PIMA MNG CO
1206 Pacific Mutual Bldg, Los Angeles 14
Pres: H T Mudd
VP: A R Thomas, A Christenson, H S Nye, P W Allen
Sec: D Evans
Treas: C W Six
(See Ariz)

PIONEER MNG CO
320 Pell St, San Francisco
Pres: G J Stempel
CAMBRIDGE PLACER, 2 1/2 mi E of N Fork, American Riv
Idle

PIONEER PYROPHYLLITE PRODUCTS
Box 886, Chula Vista
Pres & Gen Mgr: Farrar Matthews
Sec: Dorothy Benner
Elec Eng: Jim Vine
Mech Eng: Robert Wilson
MATTHEW MINE, near Del Mar, surface, fire clay, pyrophyllite
Mine Frm: Elliott Williams
500-TON MILL, dry air flotation

PITTSBURGH PLATE GLASS CO
Bartlett
Mgr: George D Dab
MINE at Bartlett, Inyo County, chemicals
Asst Supt: Clark Dudke
Chief Chem: O M Knowles
Master Mech: G E Snyder
Idle

PLACERVILLE GOLD MNG CO
56 Clark St, Placerville
Pres: Reginald Owen
VP: Lillian Holland
Sec-Treas: L F S Holland
PLACERVILLE GOLD MINES, undergr, surface, placer, talc, Au
Idle

POWHATAN MNG CO
3721 Windsor Mill Rd
Baltimore, Md
Pres & Gen Mgr: F A Mott
VP & Sec: Ch Silver
Treas: E L Farley
Off Mgr: F E Mott
SHASTA COUNTY MINE, open pit asbestos
Gen Mgr: J C Kempvance
Idle
(See Ga)

PROVIDENCE TUOLUMNE GOLD MINES, LTD
310 Post St, San Francisco
Pres & Gen Mgr: A Vannini
Sec: R Freeborn
PROVIDENCE MINE, 11 1/2 mi SE of Sonora, undergr, Au
Idle
BLUFF MINE, Humboldt County, Cu
Under devel
150-TON MILL, Tuolumne

QUARTZ HILL MNG CO, INC
Scott Bar
Pres: L J Cuneo
VP: Clarence Garibotti
Gen Mgr: R B McGinnis
Sec: J L Seligman, Jr
QUARTZ HILL MINE, Scott Bar, Siskiyou County, surface, Au, Ag
Idle
250-TON GRAV MILL, Scott Bar

RADIL, J W
444 California Street, San Francisco 4
MT GAINES MINE, Hornitos, undergr, Au
Gen Mgr: J W Radil
Supt: J A Seifert
60-TON FLOT MILL
Under devel

RAINBOW URANIUM CO
6903 Santa Monica Blvd, Los Angeles 38
FLORENCE MINE, Nye County, Cu

RARE METALS CORP OF AMERICA
1st Security Bldg, Salt Lake City, Utah
RARE 1-12 CLAIMS, Del Norte County, Cr_2O_3
(See Ariz, Idaho, Utah)

RED CLOUD MNG CO
P O Box 13, Trona
c/o W Lee Willett
RED CLOUD MINE, Inyo County, Ag

REUSS, R F
Box 72, Smith River
PAYDAY MINE, Del Norte County, 13 1/2 mi SE of O'Brien, Oreg, surface, Cr

RINCONADA QUICKSILVER MINE
Star Rt, Box 37A, Santa Margarita
Own: G P Bell
RINCONADA MINE, 13 mi E of Santa Margarita, Hg
Under devel

RIVER ROCK INC
Mgr: R M Dolan
GRAVEL PIT, Merced County

ROADS END MINES GROUP
La Crescenta
Pres & Gen Mgr H L Moore
VP & Gen Supt. Albert D Wilson
Sec-Treas: June Wilson
ROADS END, 24 CLAIMS, Big Bar, Trinity County, undergr & open pit, Cu, Ag, Co, Sb
FLOT MILL, near mine
Under devel

ROSSI HILL MINE
Box 181, Bishop
Own: J Rossi
MINE, 4 mi S of Bishop, undergr, surface, WO_3
Op: Harry David, George Lesley, Andy Grassel

RYBERG, F E
Coulterville
CAL-PENN-TEX GROUP, Mother Lode dist, Mariposa County, Au, Ag
Idle

S & C MNG CORP
510 Hobart Bldg, San Francisco
Roy Hubman, W H Casteel
BLACK DIAMOND MINE, Colusa County, Mn
RATTLESNAKE, SOUTH THOMAS MINES, Mendocino County, Mn
WHITE ROCK MINE, Lake County, Mn

ST JUDE MNG CO
P O Box 274, Redding
Pres: A P Rathbard
ST JUDE MINE, Shasta County, Au

SALMON RIVER MINES CO
Callahan
Pres & Gen Mgr: E C Latchem
Purch Agt: V W Peterson
TRAIL CREEK MINE, Au
50-TON FLOT MILL
Under devel

SAN GABRIEL VALLEY PLACERS
1137 S Greenwood Ave, Montebello
Own: Robert A Riggs
MINE, 2 mi W of Azusa, placer, Au, Ag
GRAV MILL

SAXONITE EXPLOR CO
12809 Sancolino Ave, Downey
PROCTOR MINE, Inyo County, Ag

SCHEELITE MINING CO
Box 32, Big Pine
WO_3
Idle

SCHULTZ, FRANCIS W
Box 439, Greenville
COMEBACK MINE, 9 mi W of Greenville, placer, Au
Under devel

SCHWOERER, LOWELL F
Box 23, Vallecito
RED HILL LODE, Mother Lode dist, Au, Ag
Idle

SCIOCHETTI, LOUIS
Box 637, Hollister
JUNIPER MINE, Paicines, undergr, Hg

SCOTT, J H CO
Merchants Exch Bldg, San Francisco
WASHINGTON MINE, French Gulch, Au
Idle

SEAFORTH MNG CO
Box 989, Monterey
WALLY & ANDERSON MINES, San Bernardino County, Ag
WALLY-MICKEY MINE, Inyo County, Hg

SECURITY MNG CO
354 Pine St, San Francisco
Pres: E Birleff
BOSS MINE, Nevada County, Cu

SEVEN DEVILS MNG CO
1121 E Seventh St, Long Beach
Pres & Gen Mgr: Carlee Wood
VP & Asst Gen Mgr: L A Darland
Sec-Treas: Curtis T Vondy
(See Idaho)

SHADOW MT MINES
c/o Paul McHenry, Hipton
MINE, San Bernardino County, Ag, Pb
Idle

SHAMROCK MNG CO
c/o George Topliff, 241 Jones St, San Francisco
SHAMROCK MINE, Sonoma County, Hg

SHASTA COPPER & URANIUM CO, INC
612 Dooly Bldg, Salt Lake City, Utah
BALAKLALA, SHASTA KING, SUGAR LOAF, Shasta County, Cu

SHERMAN PEAK MNG CO
Box 583, Kernville
SHERMAN PEAK & HILLTOP MINES, Tulare County, undergr, surface, WO_3
50-TON GRAV MILL

H A SHIFFER ASSOCIATES
3105 Pasadena Ave, Los Angeles 31
Pres: H A Shiffer
VP: H Beckelman
Gen Mgr & Supt. J H Stepp
Purch Agt: W Wernecke
Chief Eng: Dr Clarence A Lamb
VIRGINIA-POSO MINE, Poso Creek, Pine Mt Mng dist, Kern County, placer, black sand, Cb, Ti, Zr, Au
Geol: H A Shiffer, Jim Stark
Mgr. Harold Ellis
FLOT MILL, at mine

SHIPROCK INDUSTRIES, INC
3625 Willat Ave, Culver City
Pres: John P Sullivan
VP: O J Lilly
Sec-Treas: L B Chandler
(See Colo, N Mex)

SHOOTING STAR TUNGSTEN MINE
1124 W 2nd St, San Bernardino
MINE, undergr, WO_3, Ag, Au
Idle

SISKIYOU MNG CO
Box 2636, Buckeye Rt, Redding
GRANITE MOUNTAIN MINE, Siskiyou County, Au

SISKON CORP
422 Gazette Building, Reno, Nevada
Pres: H B Chessher, Sr
VP: E J Schrader
Sec-Treas: J E Chessher
SISKON MINE, Happy Camp, 41 mi SW of Happy Camp, open pit, Au, Ag
Gen Supt: J B Chessher, Jr
Prod: 150 tons
MILL, at mine
Mill Supt: A L McFarland
(See Ariz, Nev)

SONOMA QUICKSILVER MINES, INC
1208 DeYoung Bldg, 690 Market St, San Francisco 4
Pres: S S Smith
VP: H L Hinkle
Sec-Treas: J W Cook
SONOMA QUICKSILVER MINE (MT JACKSON MINE), Box 226, Guerneville, undergr, Hg
Supt: Douglas Myers
Cons Geol & Eng: Francis H Frederick
Mechanic: J L Galli
Prod: 80 tons
100-TON MILL, at mine, rotary furnace & condensers

SOUTHERN CALIFORNIA MINERALS CO
320 So Mission Rd, Los Angeles
Own: W K Stenck
Geol: Charles F Joy
Purch Agt: Dan Tash
DEATH VALLEY AREA TALC MINES, Shoshone, talc
Mine Supt: Ben Gomes
75-TON AIR FLOAT MILL, Los Angeles
Mill Supt. Glen Hodgin

SOUTHERN CROSS MINE
Box 178, Columbia
Gen Mgr Charles M Bryan
Own: Grant, Bryan & Foster
MINE, 14 mi NW of Columbia, undergr, Au
Idle

SPANISH MINE
100 Palm Ave, San Rafael
Own: Louis R Moretti
MINE, Nevada County, surface, baryte
Idle

SPAULDING, L B
Box 15, Ramona
METAL MT MINE, 30 mi NW of Jacumba, undergr, WO_3
Under devel
2-TON GRAV MILL (Pilot Plant)

STANDARD HILL MINES CO
c/o E B Blickinstaff, Box 302, Mojave
STANDARD GROUP, Kern County, Au

STANDARD MNG CORP
Campo Seco
Supt: William A Hooten
PENN MINE, Calaveras County, Cu

STEPHAN MNG CO
P O Box 42, Essex
STEPHAN MINE, San Bernardino County, Au

STEVENS MNG CO
c/o Frank H J Stevens, Rt 1, Box 633, Florin
JOYCE PROSPECT, Lake County, Hg

STRATEGIC METALS & MINES CORP
1613 W 50th St, Los Angeles 47
MILLZA MINE, San Bernardino County

SULPHUR MNG & SUPPLY CO
1901 East Glenoaks Blvd, Glendale
Pres: Grover Kinsray
MINE, Inyo County, S
Idle

SUN VALLEY TUNGSTEN CO
11370 Pendleton St, Sun Valley
CUSTOM MILL, Los Angeles County, WO_3

SUNSET MNG CO
213 Minna St, San Francisco
Pres: J L Balcerski
VP: W O Kay
Sec: Charles Greenberg
(See Ariz)

SURCEASE MNG CO
214 - 30th St, Sacramento
Pres: J W Hoefling
Sec-Treas: J B Gee
Ch of Bd: A M Hoefling
ATOLIA MINES, Red Mountain, 3 mi SE of Randsburg, surface, undergr, WO_3
Mgr: Paul D Hoefling
Super & Purch Agt: R C Lipold
Geol: Dionne Gardner
Master Mech: Silas Guy
100-TON FLOT MILL
50-TON GRAV MILL

SWEENEY TUNGSTEN CO, LTD
Box 188, Indio
Gen Mgr: E G Sweeney
Asst Mgr: Elmer Tubbs
Gen Supt: Dale Ervin

Geol: L Cornejo
PINTO BASIN LODE, Chuckawalla dist, Au, Ag, WO_3
RAINBOW MINE, 50 mi E of Indio, surface, scheelite, $FeWO_4$, Au, Ag
Under devel

SWEETSER, N W
Box 445, Rosamond
MINE, 4 mi NW of Rosamond, undergr, feldspar, silica
Prod: 10 tons
10-TON CRUSH PLANT, at mine

TAYLOR - KNAPP CO, THE CALIF DIV
Box 245, Tracy
Pres: S R Knapp
VP: A V Taylor, Jr & C P Knaebel
Sec-Treas: A V Taylor, Jr
Ch Eng: C P Knaebel

TEDOC MINING CO
Platina
MINES, 7 mi SW of Platina, surface, Cr

TEEKAY MINES, INC
Box 245, Tracy
LADD MINE, San Joaquin County, Mn

TEX YOUNG MINES
Box 108, San Mateo
TEX YOUNG MINE, Lake County, Mn

THOMAS, WALTER
Box 109, Big Pine
TIP TOP MINE, Inyo County, WO_3

THUNDER BIRD MINES DEVEL CO
21 Marcella Ave, San Francisco 16
Pres & Gen Mgr: Perry L Jones
CLIMAX MINE, Chilcoot, open pit, Cu, Ag, Au, U_3O_8
Asst Gen Mgr: V E Jones
Gen Supt: L L Jones
Mech Eng: Harold J Kafka
Prod: 10 tons
THUNDERBIRD MINES, Chilcoot, Plumas County, Cu, Au, Ag, Mo, WO_3
BUTTE BAR MINE, Quincy, Plumas County, Au, Ag, U_3O_8

TIGHTNER MINES CO
Rm 549, 58 Sutter St, San Francisco
Pres: Robert E McCulloch
VP: W T Jenkins
Sec: Carlo S Morbio
Treas: J Malcom Vizbal
RED STAR GROUP, 1/2 mi N of Alleghany, undergr, Au, Ag
Under devel
50-TON GRAV MILL
(Leased to Endurance Mining Co)

TOTLAND BROS
Box 341, Leevining
Gen Mgr: G H Totland
BARBARA & BIG NUGGETT MINES, 12 mi NE of Leevining, Au, Ag, Pb
BRIGHTSTAR MINE, 8 mi W of Conway, undergr, Au, Ag, Pb, Bi
Under devel

TOYON MINE CO
c/o Alvin M Bentley, Rt 1, Box 190, Calistoga
TOYON MINE, Napa County, Hg

TREG MNG & MLG CO
Box 580, China Lake
Pres: C L Green
VP: H W Evans
Sec-Treas: W H Thorpe
Purch Agt: R E Ralston
BILLIE BURKE MINE, Randsburg, undergr, scheelite
GRAV MILL, Randsburg

TULARE BROS
731 Brugess St, Grants Pass, Oreg
Own: Eugene R Brown, Beatrice Brown, Wanda Elliott
Supt: L V Tulare
HIGH PLATEAU MINE, Box 33, O'Brien, Oreg, 25 mi W of O'Brien in Del Norte County, Calif, undergr, Cr_2O_3

TULARE CO TUNGSTEN MINES
895 Lafayette Ave, Lindsay
Own: Dominick F Lavricella & Sal Naioli, Jr
BIG JIM MINE, 18 mi NE of Lindsay, undergr, WO_3
Prod: 50 tons
100-TON GRAV MILL, at mine

TURTLE MOUNTAIN MNG CO
P O Box 547, Earp
Part: A O Birch, Robert R Landrum, R G Van Horn
Gen Mgr: R G Van Horn
Met: L A Cornejo
Elec Eng: E E Clark, Jr

VIRGINIA MAY MINE, 10 mi W of Vidal Junction, undergr, Cu, Ag Au
Eng: L A Cornejo
Idle
RABBIT LEASE, 9 mi W of Cross Roads, undergr, Mn
Act Mine Frm: Carl Nabhill
Mine Eng: L A Cornejo
75-TON MILL

TWINING LABORATORIES
2527 Fresno St, Fresno
Own: Fred Twining
FLOT, MAGNETIC SEPARATION, prod-scale assaying
Met: Vernon Young

TYSON MNG CO
Box 172, Smith River
MT VIEW MINE, Del Norte County, Cr

UBEHEBE LEAD MINES, INC
356 S Spring St, Los Angeles 13
Pres: Grant Snyder
VP: E S Alexander
Sec: Allen Rankin
UBEHEBE MINE, Death Valley, 90 mi NE of Keeler, undergr, Pb, Zn Ag, Au
Leased

UMBERCI MINES, INC
1921 Hollywood Way, Burbank
VP: James J Pahie
UMBERCI MINE, San Bernardino County, Ag

UNDERWOOD, H V & PRICE M J
154 Locust Ave, Hollister
ANTELOPE COPPER MINE, 33 mi SE of Hollister, undergr, Cu
MILL at mine
Idle

UNDERWOOD, HORACE V
156 Locust Ave, Hollister
BITTER WATER QUICKSILVER MINE, Panoche dist, SE of Hollister, Hg
Idle

UNION CARBIDE NUCLEAR CO, (A DIV OF UNION CARBIDE & CARBON CORP)
Bishop
PINE CREEK MINE, 27 mi NW of Bishop, undergr, surface, WO_3, Mo
Gen Mgr: H L McKinley
Gen Supt: A C Sada
Purch Agt: C A Smith
Mine Supt: L A Wright
Frm: W H Will
Eng: D J Marki
1,000-TON FLOT MILL, Pine Creek
Supt: L E Sausa
Plant Met: J E Martinson
Frm: C W Sawyer
(See Colo, NY)

UNION COPPER CO
Copperopolis
CALAVERAS COPPER MINE, Calaveras County, Cu

UNITED MERCURY PRODUCERS ASSOC
16 Aliso Way, Menlo Park
OLD ALMADEN PROP, Santa Clara County, undergr & open pit, Hg
RETORT SMELTER

U S BORAX AND CHEMICAL CORP, PACIFIC COAST BORAX DIV
630 Shatto Place, Los Angeles 5
Pres: J M Gerstley
VP: P J O'Brien
Purch Agt: J C Walker
MINE, Boron, open pit, borate ores
Gen Supt: W J Diffley
Safety Eng: L F Clegg
Mine Supt: W H Wamsley
Asst Mine Supt: P A Conte
Frm: F M Smith
Eng: G T Otey
BORON REFINERY
Refin Supt: J T Young
Asst Supt. E D Lemon

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
OPEN QUARRY, Midland, gypsum
Works Mgr: R W Deneke
OPEN QUARRY, Plaster City, gypsum
Works Mgr: H E Hammer
(See Colo, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, NY, Ohio, Okla, Tex, Utah, Va)

U S LIME PRODUCTS CORP
2244 Beverly Blvd, Los Angeles 57
Pres: I J Harvey, Jr
Exec VP: Kennedy Ellsworth
Res Mgr, Nevada: J C MacDonald
Res Mgr, Tuolumne County, Calif
W A Stinson
Supt Sloan, Nevada: W E Ellis
Supt, Apex, Nevada: C R Prince
Supt, Henderson, Nevada: W B Malsor
Supt, Nelson, Arizona: Roy Lauer
Purch Agt: E B Long
SONORA PLANT, Tuolumne County, undergr
(See Ariz, Nev)

U S PUMICE SUPPLY CO, INC
6331 Hollywood Blvd
Los Angeles 28
Pres: Sheldon P Fay
VP L B Clark
Sec: Leona Steinhauer
Treas: George H Lindsey
Purch Agt: Frank E Lane
LEE VINING MINE & MILL, Lee Vining, surface, pumice stone
Mine Supt: D H Campbell
GLASS MTN MINE & MILL, Tuleiahe, surface, pumice stone
Mine Supt: Robert E Maggard

U S STEEL CORP COLUMBIA - GENEVA DIV
120 Montgomery St, San Francisco
(See Alaska, Ala, Minn, Pa, Tenn, Utah, Wyo)

UPPER PARADISE MINES ASSOC, INC
P O Box 713, Barstow
Pres & Gen Mgr: H A Shiffer
VP: F T Leonetti
Sec: J Wyness
Purch Agt: Walter Wernecke
VERONICA MINE, San Bernardino County, open pit, undergr, WO_3, rare earths
Mine Supt: L Ciano
Geol: H A Shiffer
Met: Harold Ellis
Under devel

URANIUM EXPLOR & MNG CO
300 Freemont St, Las Vegas, Nev
IRON HORSE MINE, San Bernardino County, Ag

UTAH CONSTR CO (MINE OPERATORS & CONTR)
1 Montgomery St, San Francisco

VERDI DEVEL CO
2623 Hyperion Ave, Los Angeles 27
Pres: Mitsuell G Kovaiashi
VP: Edward Mazzarino
Sec: Wendell Bunnach
Treas: Hiram Lewis
Asst Sec: Wm M Puharich
ROSAMOND URANIUM MINE, Rosamond, U_3O_8
75-TON MILL, at mine

VICTORVILLE LIME ROCK CO
Box 548, Victorville
Pres: L K Ayers
Sec-Treas: E A Piercy
VICTOR QUARRY, open pit, limestone
Gen Mgr: E A Piercy
Gen Supt: Emil Doty
Geol: Robert Gessner
Mech Eng: George Stone
700-TON MILL, Victorville
Mill Supt: Emmett Ball
Asst Mill Supt: Perry Whittall
Mill Frm: Harold Hoehlke

W M C MINING CO
P O Box 350, Grass Valley
Pres: Laurence J Mader
VP: Margaret Webb
Gen Mgr: Kenneth Crowder
SUNSET MINE, 7 mi NE of Grass Valley, undergr, Au, Ag
Mine Supt: L Mader
Asst Mgr: K Crowder
Under devel
45-TON FLOT MILL

WAH CHANG MNG CORP
137 Clarke St, Bishop
Gen Mgr: J J Strutzel, Jr
Asst Gen Mgr: Geo Reed
Purch Agt: Wm F Spain
Geol: Byron W Worln
Mech Eng: Bob Stewart
Met: Phil McGuire
Gen Supt: Bob Holmes
BLACK ROCK MINE, BENTON DIV, undergr, WO_3
Mine Supt: Neil Fillip
Prod: 600 tons
GRAV-FLOT MILL
Mill Supt: Fred Yarcho
(See Colo, Nev, & E A Schoh & J H Castor, Ariz)

WALKENG MINING CO
Box 138, Taylorsville
Pres: Ray B Wiser
VP & Gen Mgr: Alden H Hughes
Sec: Edson Able
MINE, 25 mi N of Taylorsville, undergr, Au, Cu, Ag
Under devel

WARM SPRINGS TALC MINE
Shoshone
Op: Louise Grantham, 1151 Council Ave, Ontario
MINE, 40 mi NW of Shoshone, talc
Supt: John Odgers

WARNKEN, LOUIS JR
Box 37, Lone Pine
DURHAM, ST CHARLES FERNANDO & ALAMEDA GROUP, Inyo County, WO_3

WATKINS, J H
Scott Bar
LADY GREY MINE, Scott Bar, undergr, Cr_2O_3
Prod: 10 tons
62-TON GRAV MILL, Scott Bar

WEBB, DAVID L
O'Brien, Oregon
WEBB MINE, Del Norte County, Hg

WEGMAN, MARGARET
P O Box 195, Randsburg
WEGMAN GROUP LODE, Mojave dist, Kern County, Ag, Au, Pb
Idle

WEST COAST CHROME PRODUCERS
Box 324, Coalinga
Own: Jack James & Andrew Thickstun
Oper: J R Holmon
MINE, 30 mi NW of Coalinga

WESTERN BARIUM CORP
110 Sutter St, San Francisco 4
Pres: J A Gorman
VP-Sec: A W Gorman
BARITE KING #1, 2, 3, 4, 5, 6 surface, barites
(Leased to Macco Corp)
MILL, Rosamond
Prod Mgr: James D Hawkins

WESTERN DEVEL CO
139 S Beverly Dr, Beverly Hills
Part: R S Hall & Maurice Willows, Jr
MINE, 10 1/2 mi NW of Blythe, open pit
Idle

WESTERN MERCURY MNG CO
Gen Delivery, Tehachapi
Supt: C T Palladino
WALIBU MINE, Kern County, Hg

WESTERN REFRACTORIES CO
Box 189, Ione
Pres: A C Gladding
VP: A L Gladding
Gen Mgr & Sec: O M Tupper, Sr
Gen Supt: H W Ensley
Sec: J Y Elwood
WESTERN TALC MINE, 14 mi SE of Tecopa, undergr, talc
Mine Supt: Marcus Seger
MILL
Supt, Los Angeles: F C Frey
Supt, Dunn: A T Krebs

WESTERN TALC CO
1901 E Slauson Ave, Los Angeles
Pres: F H Savell, Sr
VP: Malcolm Stewart
WESTERN MINES, operating on Snow Goose claim, 17 mi So of Tecopa, San Bernardino County, talc
Mine Supt: Marcus Seger
MILLS, Los Angeles and Dunn, San Bernardino County
Capacity: 150 tons per day average

WHISKEY HILL MINE
Whiskey Town
MINE, Shasta County, undergr, Au
Idle

WHITE & RAY
Box 94, Orleans
PEARCH MINE, Humboldt County, placer
Idle

WHITE MT TALC CO
Box 446, Lone Pine
Gen Mgr: Wm Bonham
WHITE MT, FLORENCE, ALBERTA
TRINITY MINES, 4 mi N of Cerro Gordon, undergr, talc

WHITESPOT MNG CORP
721 August St, Inglewood
Pres & Gen Mgr: Samuel Hughes
Treas: Mel Lloyd
Purch Agt: J C Lehan
WHITESPOT MINE, placer
Idle
50-TON GRAV MILL
Twentynine Palms

WHITNEY, H M
1044 Harvard Ave, Claremont
50-TON GRAV MILL, 13 mi SW Aguila
Mill Supt: A Christofferson

WILLOW VALLEY MINES OF CALIF
461 Market St, San Francisco
Pres: Lee G McCoy
VP: Lowell B Hoff
Sec-Treas: George V Pottgrew
Purch Agt: L Manson
WILLOW VALLEY MINES, Nevada City, undergr, Au, Ag, WO_3
Geol: J F Siegfried
Prod: 75 tons
MILL, Nevada City
Supt: Ed O Berger
Asst Supt: G E Hiller

WIND WHEEL MINE
Box 151, Columbia
Own: R O Greeves
MINE, undergr, Au, Ag
3 1/2-TON GRAV MILL, at mine
RETORT SMELTER, at mine

WYOMING GULF SULPHUR CO
Cody, Wyo
MIRACLE MNG CO PROP, near Bakersfield, U_3O_8
Under devel

YELLOW JACKET CONS GOLD MINES
120 Chester Ave, Bakersfield
Pres: Clifford Dickins
VP: A P Bullard
Sec: James Ebert
Gen Supt: C J Ayres
Geol: B C Austin
MINES, Alleghany, undergr, Au, Ag
Prod: 25 tons

YUBA CONS GOLD FIELDS
351 California St, San Francisco 4
Pres: B F Pitman, Jr
VP & Treas: Lewis B Reynolds
Sec: Richard H Keatinge
Asst Treas: A P Miller
Gen Supt: C V Denver
Geol: Leslie Gaseaway
MINES, Hammonton, Yuba County, placer, Au, Ag, Pt, 4 dredges on Yuba Riv
Mine Supt: Cecil Brophy

YUKOHL TUNGSTEN MNG CO
Box 39, Dunlap
Pres & Gen Mgr: R W Burge
TRAWEEK MINE, WO_3
Mgr: S H Strickland
35-TON MILL
Idle

COLORADO

ACME URANIUM MINES, INC
404 First Nat'l Bank Bldg, Denver
Pres: J-L Beaudin
VP: H W Luebbe
Sec-Treas: E O'Bannon
GOOD HOPE, VEVADA, ATOM MINES, undergr, V_2O_5, U_3O_8
Prod: 50 tons
Gen Mgr: John Obrecht
Mine Frm: Glen Chilcutes
CHATAQUA MINE, Montezuma, undergr, Pb, Ag, Zn, Au
Prod: 55 tons
Mine Frm: Leo Miller
65-TON LEAD FLOT MILL, Montezuma
Mill Supt: W R Clark

AJAX MNG & OIL CO
Box 1075, Grand Junction
Pres: R F Gilmore
Sec-Treas: J R Cagle
AJAX & LUCKY DAY CAVE MINES, 6 mi SW of Gateway, undergr, U, V
(Leased to Climax Uranium Co)

AJAX URANIUM CORP
1154 Bannock St, Denver 4
Pres: T J Weaver
VP: Paul McWilliams
Sec-Treas: Frances K Waggener
73 CLAIMS, San Miguel Co, U_3O_8
Geol: T J Weaver
Under devel

ALEXANDER, EARL & LINNIE
Box 33, Ouray
LOST DAY, PATSY, & HELEN MINES, Ouray, Ag, Pb, Zn

ALLEN URANIUM EXPLOR
Golden
SUCCESS GROUP, Gilpin County, Ag, Pb, Zn

ALLIED CHEM & DYE CORP, GEN CHEM DIV
Box 238, Boulder
Mgr, Mng Oper: Robert H Dishon
Asst Mgr, Mng Oper: Wilbert J Troop
JAMESTOWN MINES, 20 mi NW of Boulder, undergr, CaF_2
Prod: 100 tons
Supt: James R Pennington
Mine Frm: Jack Mann
100-TON MILL
Mill Frm: A W McGowan
Mill Frm: T J Hinshaw
(See N Mex, Mo, NY, Va)

ALTA URANIUM INC
10th & Grand, Grand Junction
Pres: R E Dorwart
VP: Tom Casto
Sec: O O Taylor
Treas: G R Simpson
(See Ariz)

ALTAMONT MNG CO
50 E 10th S, Bountiful, Utah
Gen Mgr: Geo Schultz
MINE, near Gunnison, U_3O_8
Under devel

ALTA VISTA URANIUM & OIL CO
576 Main St, Durango
U_3O_8 Prod

AMBASSADOR OIL CORP
Box 9338, 3101 Winthrop Ave, Ft Worth, Texas
MINERAL PARK 84 MINE, 826 Rood Ave, Box 413, Grand Junction, undergr, U_3O_8, V
Eng: Francis X Corbett
(See Texas)

AMERICAN LEDUC URANIUM
200 N 6th, Grand Junction
HENDERSON #1 MINE (ECONOMY CLAIMS), Outlaw Mesa area, Mesa County, U_3O_8
PROPERTIES, Montrose County, U_3O_8
(See Utah)

AMERICAN SMELTING & REFINING CO
903 First Nat'l Bank Bldg, Denver 2
Mgr: J Paul Harrison
ARKANSAS VALLEY PLANT, Pb
Box 973, Leadville
Supt: T P Fahey
Asst Supt: L C Brown
Metallurgists: M D Rood, R Bancks, P A De Santis, Q Cohenour
Master Mech: C Hopfinger
Chief Clerk: Edward J Kelly
Safety Eng: Frank Stevens
Plant Eng: R L Armbruster
Ch Assayer: R J Elliott
Ch Chem: Max Kasten
GLOBE PLANT, Denver, Cd
Supt: W L Miles, Jr
Asst Supt: Max Coats
Safety Insp: J J Ryan
LEADVILLE MNG DEPT
Mine Supt: A Haesler
IBEX-SUNDAY, ECLIPSE-IRENE, FRYER HILL & ROBERT EMMETT OPNS, Zn, Pb, Au, Ag
(See Aris, Calif, Idaho, Ill, Kans, Md, Mont, Nebr, N J, N Mex, N Y, Tex, Utah, Wash, & Federal Mng & Smelting Co, Mo)

ANDRESS, CLYDE & ASSOC
Placerville
PAYROCK MINE, Mesa County, U, V

ANDREWS, K M & D K
Box 87, Nucla
BADGER MINE, undergr, U_3O_8, V_2O_5
JUPITER MINE, Gunnison County, U_3O_8, Cu
Under devel

ANNA C MNG CO
c/o Olin B Scott, Rye
ANNA C MINE, Boulder County, WO_3

ANSCHUTZ DRILLING CO, INC
1411 Mile High Center, Denver
Pres: Fred B Anschutz
VP: Del E Webb
Sec: Donald S Stubbs
Mgr, Mng Dept: J B Canter
Geol: Louis Gas, Kenneth Holden
AMERICAN EAGLE MINE, Gypsum Valley, undergr, open pit, U_3O_8
(See Wyo)

ARBOGAST, M L
Rt 4, Grand Junction
U_3O_8 Prod

ARCO MNG CO
P O Box 1500, Grand Junction
Managing Part: Lyle F Campbell
LOST DUTCHMAN MINE, Denver Mesa County, undergr, U_3O_8, V_2O_5
Mine Frm: Herbert L Keller

ARGYLE MNG & MLG CO
670 Pearl St, Denver
MINES, San Juan City, Au, Ag, Cu, Pb, Zn
Under devel

ATOMIC FUEL EXTRACTION CORP
Bedrock
URANIUM MILL, Bedrock, Montrose County
(AEC has authorized mill contract)

ATOMIC POWER URANIUM CORP
Box 2366, Denver
Pres: Lucien Hugh Cullen
VP: Thomas S Bryan
Sec: H Arnold Guy
Treas: James E Kelley
KNOT MINE (FORD-FORDO CL)
Box 1224, Grand Junction
Gen Mgr: Desmond Peterson
Geol: Douglas O McGeon
Undergr U_3O_8 prod
EAGLE CO CL, U_3O_8
Under devel

AURORA URANIUM CO
317 Main St, Grand Junction
LITTLE JONNIE MINE, Mesa County, U, V

AUSMUS & HIGHTOWER
Naturita
U_3O_8 Prod

AUSMUS & STAATS
Naturita
U_3O_8 Prod

B & B MNG CO
Albuquerque, N Mex
U_3O_8 Prod

BACHELOR MINE
c/o Carl I Diamant, 3037 Birch St, Denver 7
MINE, near Ouray, undergr
Idle

BALBOA MNG & DEVEL CO
125 N 8th St, Grand Junction

BALD EAGLE MNG CO
Travel Center Bldg, 1640 Court Pl, Denver
(A joint venture between Jackpot Oil Co and Hafen Leavitt)
BALD EAGLE MINE, Idaho Springs, undergr, Au, Pb, Ag, Cu, Zn
Gen Mgr: R Gerald Hughes, Hafen Leavitt
Mine Supt: I D Crawford
Mine Eng: John H McElroy
Prod: 40 tons
125-TON FLOT MILL, at mine
Mill Supt: Charles Quinn
SMELTER, Leadville

BARD CREEK MINE
Empire
Own: A F Mayham
MINE, near Empire, Au, Ag, Pb, Zn
Under devel

BARKER, DELBERT W
P O Box 263, Nucla
U_3O_8 Prod

BARKLEY AND CO, INC
Box 8, Cripple Creek
Pres: A C Denman
VP: George F Stiner
Treas: Eugene Beagles
Gen Mgr: Troy E Wade
AEC RESERVE BLOCK 6 MINE, Box 554, Uravan, undergr, U_3O_8, V_2O_5
Geol: Elmer V Reinhardt
Mine Frm: Sol Sanchez
Prod: 5 tons

BARTON URANIUM CO
304 Uranium Center Bldg, Grand Junction
Pres: S W Barton
Sec: Olive H Roy
PAY DAY GROUP, Uravan, 12 mi W of Uravan, U_3O_8, V
Supt: Wm Doertenbach
Geol: J M Harlan

BEAVER MESA URANIUM INC
P O Box 587, Grand Junction
Pres: Alan M Simpson
VP: Charles V Woodard
Sec: D Howe Moffat
Treas: Mark Holloway

BEAVER MESA MINE, Caloway dist, undergr, U_3O_8, V_2O_5
Gen Mgr: Alan M Simpson
Mine Supt: Paul Holdeman
Asst Mine Supt: Robert C Wells
Prod: 150 tons

BEE - SHO - SHEE MNG CO
c/o George Hewitt, Prulia
(See Ariz)

BENHAM, RAYE
Ekdoren
U_3O_8 Prod

BERTOCH, B H
P O Box 65, Egnar
U_3O_8 Prod

BERYLLIUM MNG CO, INC
Box 276, Gunnison
Pres: J B Wemlinger
Gen Mgr: C A Wemlinger
VP: J E Sheets
Sec: J T Dickey
OHIO CITY MINE, 22 mi from Gunnison, surface, beryl, mica, feldspar, tantalite, columbite
Under devel

BINDER, P V
Naturita
U_3O_8 Prod

BISHOP CANYON URANIUM CORP
Box 2016, Hobbs, N Mex
HOGBACK MINE, Dove Creek, undergr, U_3O_8, V_2O_5
Lessee: Bob Estes
Prod: 5 tons
(See N Mex)

BLACK GIRL MINES CO
2813 Hollins St, Bakersfield, Calif
Box "M", Ouray
VP: J M McFadden
Sec: Mrs Doris E McFadden
BLACK GIRL MINE, Ouray, undergr, Ag, Cu, Pb, Au
RED MT MINE, Red Mt, undergr, Ag, Cu, Pb, Au
Gen Mgr: J M McFadden
Geol: Dr C M Shaw
Under devel
(See Calif)

BLACK MNG CO
Silverton
SILVER LEDGE MINE, San Juan County, Ag, Pb, Zn

BLUE CREEK MNG CO
c/o Esther S Crane, P O Box 308, Aztec, N Mex
U_3O_8 Prod

BLUE RIDGE MINES
c/o B L Groth, 1434 Filmore, Denver
BLUE RIDGE MINE, Clear Creek County, Au

BONITA MNG & DEV CO
Box 186, Silverton
Pres: F C Brightly, Jr
Gen Mgr: H P Ehrlinger
Sec: V G Rinn
LEAD CARBONATE MINE, 11 mi NE of Silverton, undergr, Au, Zn, Pb, Ag, Cu
PRIDE OF BONITA MINE, 11 mi N of Silverton, undergr, Pb, Ag, Zn
EMMA-OREGON GALENA GROUP, San Juan County, Zn, Pb, Ag
Under devel
50-TON FLOT MILL, Gladstone
Supt: H P Ehrlinger

BOREALIS MNG CO
Aspen
Pres: Alton Beck
MONTEZUMA MINE, Pitkin County, Ag, Pb, Zn

BRIDGER - JACK INC
160 W Main St, Grand Junction
Pres: Garth W Thornburg
VP: O E Thornburg
Sec: J E O'Connor
(See Utah)

BRITISH WESTERN AMERICA URANIUM CORP
821 1st Security Bank Bldg, Salt Lake City, Utah
GRIZZLEY MINE, Georgetown, undergr, Pb, Au, Ag, Cu
Gen Mgr: Robert A Stubblefield
Mine Supt: Tim Wade II
Prod: 100 tons
110-TON FLOT MILL, Georgetown
Mill Supt: Charles Federhaef
(See Utah)

BROWN MINES
P O Box 243, Montrose
U_3O_8 Prod

BUCKEYE MNG CO
123 Myrtle Pl, Cortez
U_3O_8 Prod

BUCKSKIN JOE MINES, LTD
Alma
Gen Mgr: C W Jordan
PHILLIPS MINE, undergr, Au, Ag, Cu, Pb, Zn, Fe
under devel

BUFFALO HEAD MNG CO
P O Box 964, Craig
U_3O_8 Prod
Under devel

BUNKER & CO
P O Box 183, Naturita
U_3O_8 Prod

BURKE - MARTIN MINES, INC
901 Sherman, Apt 1411, Denver 3
BURKE GROUP, Summit County, Ag, Pb, Zn

BURREL, DOROTHY M
Meeker
U_3O_8 Prod

CADWELL MNG CO
c/o Vernon L Phillips, 504 W 8th St, Leadville
HAYDEN SHAFT, Ag, Pb, Zn

CALLAHAN ZINC - LEAD CO
Box 144, Gunnison
AKRON MINE, Whitepine, Zn, Pb, Ag,
Gen Supt: James E Dunn
Idle
(See N Y)

CAMOOSE URANIUM MINES
P O Box 115, Grand Junction
U_3O_8 Prod

CAMP BIRD LTD
70 Pine St, New York 5, N Y
Chmn: John Dalgleish
Cons Eng: C Maxwell Norman
Sec: Ian Whyte
CAMP BIRD MINE, Ouray, undergr, Pb, Zn, Cu, Au, Ag
Under devel
Gen Mgr: John G Strahl
Mine Frm: Walter Smith
Ch Geol: C P Tremlett

CANFIELD, ARTHUR
P O Box 84, Dove Creek
U_3O_8 Prod

CARPENTER, MORRISON URANIUM & OIL CO
P O Box 284, Moab, Utah
U_3O_8 Prod

CATARACT MNG CO
(See San Juan Mng & Devel Co)

CENTRAL URANIUM & MLG CORP
Box 277, Central City
Gen Mgr: George C Richart
MINES, Gilpin County, Au, Pb, Zn, Cu, Ag, U_3O_8
Under devel

CHAIN O'MINES OPERATORS INC
Box 606, Central City
PATCH MINE, Gilpin County, Ag, Pb, Zn

CHAMPION MINES CO
941 Monroe St, Denver 8
Pres: Jesse Simmons
Sec: J J Simmons
MORNING STAR & LAST CHANCE MINES
LEASES ON JERRY JOHNSON, WPH & FOREST QUEEN MINES, Cripple Creek, undergr, Au
Idle

CHAVEZ, J A
P O Box 416, Nederland
BONANZA PLACER, WO_3
Prod: 75-100 tons

CHEROKEE MINES
231 S Grant Ave, Ft Collins
Pres: T H Sackett
VP: V E Cram
Sec-Treas: Jas H Andrews
BLACK HAWK #1 & 2 MINE, undergr, U_3O_8
Gen Mgr: T H Sackett
Idle

CHEROKEE URANIUM MNG CORP
606 Equitable Bldg, Denver
Pres: James S Henderson
MINES, Gilpin County, Au, Ag, Cu, Pb, Zn, U_3O_8

CHESAPEAKE & COLORADO CORP
909 18th St, NW, Washington, 6, DC
135 S 4th St, P O Box 1290, Grand Junction
Pres: Francis M Tompkins
VP: Lytle Brown, Jr
Sec: Gillis W Long
Treas: Howard Ritter
CALEDONIAN MINE, Silverton, Ag, Pb, Zn
Gen Mgr: Lytle Brown, Jr
Gen Supt: Dutch Hildebrand
Prod: 100-150 tons
(See N C)

CINDERELLA URANIUM & OIL, INC
905 McBurnett Bldg, San Angelo, Texas
KING SOLOMON #1, c/o Spencer Heights, Delvue, undergr, U_3O_8
Gen Mgr: Marvin C Hanz
Genl: Mark A Eidelbach
Elec Eng: Nicholas H James
Field Super: Douglas A Williams
Mine Supt: Holvey H Enochs
under devel
(See Texas)

CLIMAX MOLYBDENUM CO
Climax
VP & Gen Mgr: Frank Coolbaugh, Mines Park, Golden
Res Mgr: Robert Henderson
Gen Supt: Edwin J Eisenach
Asst Gen Supt: John Petty
Dir of Explor: John Curson
Geol: Stewart Wallace
Mech Eng: William Vierling
Met: R E Cuthbertson
Elec Eng: Urban Toucher
Ind Rel Dir: R C Miller
Planning & Devel Eng: Max Gelwix
MINE, undergr, MoS_2, WO_3, FeS_2, Ba
Mine Supt: Wm F Distler
Asst Mine Supt: Joffre Johnson, Charles Cisneros
Mine Frm: Tom Phipps, Bill Gill, Bill Nelson
Prod: 34, 000 tons
34, 000-TON FLOT MILL, at mine
Mill Supt: Frank Windolph
Asst Mill Supt: Fred Hoff
(See N Y, Pa)

CLIMAX URANIUM CO
Box 1901, Grand Junction
Pres: Frank Coolbaugh, Mines Park, Golden
VP & Gen Mgr: A M Mastrovich
Purch Agt: L J Mann
Consult: E J Daggan
MINES, near Grand Junction, undergr, U_3O_8, V_2O_5
Mgr: Mines: L J Brewer
Prod Supt: T E McCandless
Gen Frm: Andy O'Korn
Ch Geol: R J Wright
Geol: R P Darnell, P Dunnerstag, W A Roberts, R M Warner, E D Bieber, R T Nakaoka, E T Anderson, J C Moore, C R Bows
CHEM MILL, Grand Junction
Mgr: R C Toerper
Asst Supt: Paul Wire
Master Mech: G K Burnhart
Ch Met: R E Musgrove
Ch Chem: Q S Kocher
(See Ariz, N Y, Utah)

CLYDE URANIUM MINES
P O Box 58, Moab, Utah
U_3O_8 Prod

COCREHAM, W A
3165 W Colorado, Colorado Springs
VALLEY VIEW MINE, mica, feldspar

COG MINERALS CORP
727 Third Ave, Grand Junction

COLD SPRING TUNGSTEN, INC
1st Nat'l Bank Bldg, Denver
Pres: Boris Pregel
VP: Alexander Pregel
Sec: Paul Newton
COLD SPRING MINE, Nederland, undergr, WO_3
Gen Mgr: Dr G C Ridland
Asst Gen Mgr: Chas H Turner
Mine Supt: Sam D Walter
Prod: 50 tons
50-TON GRAV MILL, Nederland
Mill Supt: Wm R Nolan
(See N Y)

COLONIAL NUCLEAR INDUSTRIES, INC
45 United States Bank Bldg, Grand Junction
Pres: Robert I Ludwig
VP: C W Schrader, R D Hughes, W Haselbush
Sec: O S Halvorson
Treas: O M Duckett

COLO AGGREGATES CO, INC
Mesita
Pres: Geo M Oringdulph
VP: W W McClintock
Sec-Treas: Henry Quiller
MESITA MILL MINE, 2 mi W of Mesita, surface, volcanic scoria, Gen Mgr: Geo M Oringdulph
Frm: Robert Compton
Prod: 300 tons

COLO FUEL & IRON CORP
Continental Oil Bldg, Denver
Pres: A F Franz
Sec: D C McGrew
Treas: H C Crout
MINING DEPT, Box 316, Pueblo
VP, Oper: J J Martin
Dir, Purch: L C Rose
Mgr, Mines: R R Williams, Jr
Ch Eng: Mng Dept: W J Schenier
Ch Geol: D A Carter
Ch Elec: J W Irwin, Trinidad
MONARCH QUARRY, limestone, Salida
Supt: J E Whitney
Prod: 2, 000 tons
CANON DOLOMITE QUARRY
Canon City
Supt: E C Jagow
Prod: 325 tons
(See Utah, Wyo)

COLO GOLD KING MINES, INC
Box 186, Silverton
Pres & Gen Mgr: H P Ehrlinger
VP: A D Miner
Sec-Treas: V W Tookey
GOLD KING MINE, undergr, Au, Ag Pb, Zn, Cu
Under devel

COLO TRI-STATE MNG CORP
332 Colorado Nat'l Bank Bldg, Denver
Pres: G F Hardwick
VP: A Kaneksberg
Sec: J J Foley
Treas: Walter Wilson
MINE, open pit, CaF_2
500-TON HEAV-MED MILL, Dillrat
Under constr

COLUMBINE PLACER MINES INC
Rm 308, 1030-15th St, Denver 2
Pres: Samuel Johnson
Sec: Dwight P Johnson
RED BUCK MINE, 35 mi NE of Gunnison, undergr, Au, Ag, Cu
Under devel

COMMERCIAL MNG, INC
Box 303, Marshfield, Wisc
RESERVATION MINE (leased), undergr, U_3O_8, V_2O_5
Under devel
(See Wisc)

CONGRESS URANIUM CORP
402 Darling Bldg, Salt Lake City, Utah
Pres: Leo G Meredith
Sec-Treas: Karl F Burll
CONGRESS MINE, Bull Canyon
Under devel

CONSOL GOLD - URANIUM CORP
308 Columbine St, Denver 6
Pres: R E Harker
VP & Purch Agt: Ralph Bradley
Sec-Treas: R L McCoy
Gen Supt: C L Barker
Mech Eng: H E Grosvenor
Mine Supt: Leslie Barker
TREASURE KEY TUNNEL, Blackhawk, undergr
Under devel
JOHNNY BULL, Silver Plume, undergr, Ag, Pb

CONSOL URANIUM MINES, INC
307 Darling Bldg, Salt Lake City, Utah
URANIUM EXPLOR & PROD, various prop in Colo
(See Nev, Utah)

CONTINENTAL URANIUM, INC
820 S Ninth St, Grand Junction
Pres: Willard Gidwitz
Sec: Max H Braun
Bd Chmn: Gerald Gidwitz
(See Utah)

CORONADO COPPER & ZINC CO
430 1/2 Main St, Grand Junction

COSTELLO LEASE
Bonanza St, Villa Grove
Op: W J Costello
RAWLEY MINE, Bonanza, 20 mi NW of Villa Grove, undergr, Pb, Zn, Ag, Cu
Prod: 50 tons

COUCH & TRONE
Naturita
U_3O_8 Prod

CRAZY GIRL MNG CO
Idaho Springs
CRAZY GIRL MINE, Ag, Pb, Zn

CRESCENT URANIUM MINES, INC
Denver
CRESCENT CLAIMS, Outlaw Mesa, Montrose County, U_3O_8

CRESSON CONSOL GOLD MNG & MLG CO, THE
Box 127, Cripple Creek
Pres, Merrill E Shoup
VP & Gen Mgr: Max W Byram
Sec: H Bates
Supt: Wilbur Wassaw
Mech Eng: Geo Lorenz
Purch Agt: H L Stone
MINE, 3 mi E of Cripple Creek, undergr, Au
Mine Supt: A H Bebee, Jr
Prod: 150 tons

CRIPPLE CREEK MNG & MLG CO
Box 247, Cripple Creek
Pres: Lizzie Hagler
Sec: John Adair
Gen Mgr: Richard B Walls
GOLD KING MINE, 1 mi from Cripple Creek, undergr, Au
Idle
(See Ariz)

CROWN MNG CO
125 N 8th, Grand Junction

CROWN URANIUM COMPANY
Box 163, Casper, Wyo
LOST BROTHERS MINE, Norwood, Bull Canyon Dist, surface, U_3O_8
TOM CATS MINE, Mineral Mt, surface, U_3O_8
Gen Mgr: D B Wade
Gen Supt: Ray Barron
Under devel
(See Utah, Wyo)

CRUSADER OIL & URANIUM CO
1717 E Colfax Ave, Denver 18
Pres: James B Mason
VP: Dwight H Elder
Sec-Treas: H C Bartholomew
PROSPECT, Colo
Geol: Harrison F Murray, Boulder
(See Utah, Wyo)

CULLEN MINERALS CORP
619 Rood Ave, Grand Junction
Pres: Lucien H Cullen
VP: K D Kausch
Sec-Treas: T N Tucker
(See Utah)

CUMBRES MNG CO, INC
Box 694, Alamosa
Pres: Whigford W Myers
VP: Richard Frisk
Sec: Pedro Vigil
Treas: Brownie Clark
Gen Mgr: C O Rosacker
CLAIMS, Sangre de Cristo Range, N of Alamosa, rare minerals
REDWING LEASES, near Redwing, U, V, cerium, rare earths
Under devel

CYPRUS MINES CORP
430 1/2 Main St, Grand Junction
URANIUM CLAIMS
(See Ariz, Calif)

D & J URANIUM & EXPLOR CO
325 N Santa Fe, Pueblo
Pres: Russell L Jewett
VP: Frederick E William
Sec: Tom Harkness
Treas: Seaman A Jewett
Dir: Garrett Ponds
BONITA MINE, Pueblo, undergr, U_3O_8
Mgr: S A Jewett
Asst Mgr: R L Jewett
Under devel

DALLAS URANIUM & OIL CORP
332 Mercantile Commerce, Dallas Texas
U_3O_8 Prod

DAVENPORT, W L
Breckenridge
WELLINGTON MINE, 2 1/2 mi E of Breckenridge, undergr, Pb, Zn, Ag, Au
Prod: M tons
Mine Supt: Harold Hess
Mine Eng: Marvin Burger

DEFENDER MNG CO
640 Enid, Okla & Silver Cliff
Part: Roy O Pratt, Vic Greer, Enid
E F Stacy, Wm Cody, Silver Cliff
DEFENDER MINE, undergr, Pb, Zn, Ag
Gen Mgr: E F Stacy

DENVER - GOLDEN OIL & URANIUM CO
780 Denver Club Bldg, Denver
Pres: Charles O Perine
VP: G H Brodie
Sec: Roy O Goldin
Treas: Barney Jones
SCHNARTZWALDER MINE (Ralston Creek), Box 100, Golden, Jefferson County, U_3O_8
Gen Mgr: E C Rice
Asst Gen Mgr: Clyde I True

DENVER NABOB MNG CO
Lawson
NABOB MINE, Clear Creek County, Ag, Pb, Zn

DEVEREAUX BROTHERS
P O Box 373, Meeker
U_3O_8 Prod

DOUG DEVERICH MNG CO
1139 Colorado Ave, Grand Junction

DILLON, RICHARD
Geol Dsl, Carson
U_3O_8 Prod

DIVERSIFIED RESOURCES INC
201 N 5th, Grand Junction
PROPERTIES, Gateway Mng dist, Mesa County
(See Utah)

DODGE URANIUM CORP
326 Majestic Bldg, Denver &
Uranium Center Bldg, Grand Junction
Pres: Sumner D Dodge
VP & Sec: E B Yakes
Treas & Asst Sec: K G Dexter
PALISADE MTD, Gateway
Gen Mgr: Wallace W Winfield
Asst Gen Mgr: Howard Knoll
Helicop Pilot: Don Williams
undergr U_3O_8 prod
(See Utah)

DOEPKE MNG CO
2438 N Nevada Ave, Colorado Springs
Mgr: Frank D Doepke
GOLD KING, LEXINGTON, & MATTIE L MINES, Teller County, Au

DOWELL & ASSOCIATES
Manitou
U_3O_8 Prod

DOYLE URANIUM CORP
Box 1421, Colorado Springs
Pres: M K Doyle
VP: J D Stone
Sec-Treas: E G Unash
PITCH FORK MINE, Naturita
Gen Supt: Jim Galyean
Geol: Cleo Bascom
Undergr U_3O_8 prod

DULANEY MNG CO
312 First Nat'l Bank Bldg
Grand Junction
Pres: R O Dulaney
VP: C H Dulaney & Harry B Friedman
Sec-Treas: Thomas E Potts
Gen Mgr: Frank H MacPherson
Gen Supt: Leroy Hemphill
Geol: Philip P Powers
Purch Agt: Mrs Inga Potts
RADIUM GROUP OPER, 35 mi S of Dove Creek, undergr, U, V
Prod: 175 tons

R L DUNCAN MNG CO
P O Box 92, Dove Creek

WALTER DUNCAN MNG CO
2312 1st Natl Bldg, Oklahoma City, Oklahoma
U_3O_8 Prod
(See Ariz)

E & H LEASING CO
Hecker
BURRELL #1 & LAST DAY MINES, Montrose County, U

EAST RIDGE CO
Box 559, Ouray
Gen Supt: A E Dirrim
ANDRUS MINE, 14 mi NW of Silverton, undergr, Zn, Pb, Cu, Ag, Au
(See Calif)

ECKMAN, W B
Naturita
U_3O_8 Prod

EGGERS, C F
Dove Creek
DOLORES MINE, Slickrock dist, San Miguel County, undergr
Under devel

EMPERIUS MNG CO
Emperius Bldg, Creede
Pres: T B Ponson
Treas: H B Hayden
Gen Mgr: B T Ponson
EMPERIUS MINE (ROBINSON & AMETHYST), 1 1/2 mi N of Creede, undergr, Pb, Zn, Ag, Au, Cu
Mine Supt: T B Ponson
Mine Frm: A M Davis, R R Lohman
Prod: 150 tons
150-TON FLOT MILL, 1 mi S of Creede
Mill Supt: T B Ponson
Assay: Gordon H Scollins

EQUITABLE URANIUM CORP
727 Cooper Bldg, Denver
Pres: Melvin C Bowles
VP: A L Heflin
Sec: Glenn C Leader, Jr
GOVERNOR MINE & CLAIMS, Box 352, Bishop Canyon, Slick Rock Mng dist, undergr, U_3O_8, V_2O_5
Gen Mgr: Melvin C Bowles
Supt: Vernon K Bowles

ERNIE & CO INC
528 Main St,
Grand Junction
U_3O_8 Prod

ETA MINES
317 Main, Grand Junction
Part: Frank L Seymour, Vernon Pick & Jim Martin
RAE MARIE MINE, 10 mi W of Gateway, undergr
Mine Supt: James P Martin
Under devel

EUREKA TUNGSTEN CO
3255 S Cherokee St, Englewood
Part: John S Keifer, E B Ralston
EUREKA MINE, Sugar Loaf mng dist, Boulder County, undergr, WO_3
Gen Mgr: E B Ralston
Prod: 100 tons per month

FEDERAL URANIUM CORP
215 N 5th, Grand Junction
LARK-LEIGHTON GROUPS, Bull Canyon area, Montrose County
(See Utah)

FINCHER, OTIS
824 Pine St, Grand Junction
RONNIE #1 MINE, Mesa County, U, V

FIRST NAT'L OIL & MINERAL CO
Box 205, Marion
GOLD DOLLAR MINE, Montezuma County, Ag, Pb, Zn

FLANDERS MNG CO,
(See Pacific Industries, Inc)

JOSIE K FOLSOM MNG & MLG CO, LTD
4280A Holly Ave, St Louis 15, Mo
JOSIE K FOLSOM MINE, Saguache County, undergr, Au, Ag, U_3O_8
Gen Mgr: Fred W Kublin
Idle
(See Mo)

FOOTHILLS MNG CO
3240 9th St, Boulder
Pres: C A Wilcox
VP: L F Jonick
Sec-Treas: L B Sweet
Purch Agt: C I Swasby
WRIGHT LEASE, Idledale, undergr, U_3O_8, V_2O_5
Gen Mgr: C I Swasby
Asst Gen Mgr: V E Wilcox
Gen Supt: C I Swasby
Geol: H L Bird
Prod: 25 tons

FORD URANIUM MINES
Monticello, Utah
U_3O_8 Prod

FORGE HILL TUNNEL
Rt 3, Box 367, Golden
Gen Mgr: Clifford E Morrison
Asst Mgr: W A Horne

FAIRMONT TUNNEL, 1/2 mi SW of Russell Gulch, undergr, Pb, Zn, Ag, Au, Cu, U_3O_8
Under devel

FORTUNE URANIUM MINES
1475 S Main St, Salt Lake City, Utah
U_3O_8 Prod

FOSTER, HERBERT
1217 Colorado Ave, Grand Junction
U_3O_8 Prod

FOSTER, RALPH
1217 Colorado Ave, Grand Junction
SNOW SHOE, MESA #5

FOUR CORNERS EXPLOR CO
Petroleum Bldg, Grand Junction
Part: F O Manoi, Irving Rapaport
Gen Mgr: F O Manoi
Ch Geol: Irving Rapaport
Field Geol: Forrest Pincher
BACHELOR MINE, Box 63, Naturita, U_3O_8, V_2O_5
McCORMICK MINE, Box 318, Dove Creek, U_3O_8, V_2O_5
Prod: 25 tons
Mine Supt: J W McCormick
Mine Frm: Marvin Randolph
(See N Mex)

FOUR CORNERS URANIUM CORP
633 Guaranty Bank Bldg, Denver
Pres & Gen Mgr: E H Sanders
VP: J W Gramlich, E L Clark
Sec-Treas: Taft Barrow
Cons-Eng: C R Wilfley
Mng Eng: James Baldwin
LION CREEK MINES, (3), La Sal Canyon dist, (Mail) La Sal, Utah), U_3O_8, V_2O_5
Gen Mgr: W R Bronson
BULL CANYON GROUP (5), Bull Canyon dist
Gen Mgr: Joseph N Trudgeon
PALLAORO MINE, Morrison
Mgr: Robert Stause
Total Prod: 150 tons
(See Utah and Largo Uranium Corp, N Mex)

FRONT RANGE MINES, INC
Burns Vault Bldg, Denver
Pres & Gen Mgr: John Doerksen
VP: Paul R Spender
Sec-Treas: H P Macauley
MATTIE MINE, Clear Creek County, Pb, Au, Ag
MELVINA MINE, Boulder County, Au
STRONG & MARY CASHER MINES, Teller County, Au
KING SOLOMON GROUP
Under devel
CLEAR CREEK MILL, Dumont, flot
Capacity: 200 tons

FRONTIER MNG CORP
130 W Main St, Grand Junction
U_3O_8 Prod

GADDIS MNG CO
1500 Mile High Center, Denver 2
PROSPECT, W of Vail Pass, Eagle County
(See Wyo)

GALTIE BOY MINES, INC
c/o Alfred O Brehmer, 210 Mercantile Bldg, Denver
HERCULES MINE, San Juan County, Ag, Pb, Zn

GARDNER & CO
P O Box 252, Naturita
U_3O_8 Prod

GARFIELD MINE
Box 209, Salida
Gen Mgr: W E Burleson
Contractor: Carl McMullen
GARFIELD MINE, 20 mi W of Salida, undergr, Pb, Au, Ag
Idle

GARFIELD MINES, LTD
302 Main St, Grand Junction
Pres: John Burton
VP: F Myers
Sec: Frank Nisley
Treas: J DeVries
FALLS PROPERTY, Rifle undergr
Geol: G C Ridland
Under devel

GAYNO MNG CO
730 N 3rd St, Montrose
U_3O_8 Prod

GENERAL MINERALS CORP
440 Henderson Bldg, Dallas 6, Texas
DISTRICT OFFICE
Petroleum Bldg, Grand Junction
SUMMITVILLE MINE, Box 472, Monte Vista, Cu, Au, Ag (Prospect), Undergr
Gen Mgr: Dr R V Gaines
Asst Gen Mgr: Robert L Jones
Gen Supt: Royal Sorenson
(See Texas)

GENERAL RESOURCES LTD
534 Commonwealth Bldg, Denver 2
Pres: W E Roberts
VP: J S Carter
Sec-Treas: Clarence Castner
Under devel

GERANIUM MNG CO
c/o Harold Bowen, Gateway
U_3O_8 Prod

GERONIMO URANIUM MNG CORP
345 S State St, Salt Lake City, Utah
PARROT GROUP, U_3O_8
Prod
(See Utah)

GIANT RESOURCES, INC
P O Box 1681, Grand Junction
Pres: Donald W Kanaly
VP & Treas: Harold R Babcock
Sec: Clarence Corey
Gen Mgr & Purch Agt: Ed Strnad
LITTLE DORA & THE EMPIRE MINES, Silverton, undergr, Ag, Pb, Zn, Au
Gen Supt: George Hazen
Geol: Warren Prosser
Mng Eng: Robert L Rock
Prod: 50 tons
(See S D)

GIBRALTAR URANIUM & OIL CO
Box 352, Grand Junction
Pres: I W Andrews, Jr
(See Ariz)

GLOBE HILL MNG CO
336 Independence Bldg, Colorado Springs
Pres & Gen Mgr: A S Kesselman
VP: Payson Gregory
Sec-Treas: George P Grote
URANIUM EXPLOR & PROD, Colo Plateau
Mine Supt: August Windhaus

GLORY HOLE INC
Central City
LACROSSE MINE, Gilpin County Ag, Pb, Zn
PATCH MINE, Gilpin County, Au

GOLD CHIEF MINES, INC
Box 218, Central City
Pres: Maude W Russell
WE GOT EM GROUP, Gilpin County, Ag

GOLD MINES CONSOL, INC
315 Colorado Bldg, Denver
TERRIBLE DUNDERBERG GROUP, Ag, Pb, Zn

GOLD RANGE, INC
2200 E Colfax Ave, Denver
UTICA GROUP, Boulder County, Au

GOLDEN COIN MNG CORP
Box 418, Fruita
Op: Carl Losey
Under devel

GOLDEN CYCLE CORP
P O Box 86, Carlton Bldg, Colorado Springs
Pres: Merrill E Shoup
Exec VP & Gen Mgr: Max W Boven
Asst Gen Mgr: G Murray
Treas: John Jacobs, Jr
Sec: H Bates
Mines Mgr: Charles Carlton
Purch Agt: Howard Stone
AJAX MINE, Cripple Creek, Au
Supt: M H Grice
1,000-TON FLOT-CYAN MILL (Carlton Mill), at mine
Supt: Howard Keil
URANIUM DIVISION
MINE, Atkinson Mesa near Uravan
Supt: Howard Barnett
EXPLORATION
Field Supt: T J Ballard

GOLDEN DAWN URANIUM CORP
243 N 9th W, Provo, Utah
Pres: Roy A Shane
VP: Walter J Eddy
Sec-Treas: Dee Cavin
Purch Agt: Veal S Perry
MINE, Chaffee County, undergr, U_3O_8, rare earths
Gen Mgr: Veal S Perry
Geol: Roy A Shane
Mine Frm: Joseph V Dodge

GOLDEN EAGLE MNG CORP
150 Colorado Ave, Grand Junction
GOLDEN EAGLE MINE, Leadville, Lake County, Au

GRAMLICH MINERALS INC
Moab, Utah
U_3O_8 Prod

GREAT BASINS PETROL CO
207 Denham Bldg, Denver
Pres: C G Glassock, Jr
VP: Harvey L Burley, Robert J Munn
Sec-Treas: D E McLendon
KEYSTONE, SANTA MARIE, RAINBOW MINES, near Dove Creek, open pit, U_3O_8, V
Geol: Howard H Odbert

GREAT FRONTIER MNG CORP
847 Glenwood Ave, Grand Junction
Pres: Wm J DeMik
Sec-Treas: David Katz
CEDAR POINT MINE, undergr
Gen Mgr: S P Clyborn
Contract Miner: Bert Foster
Prod: ? tons

GREAT LAKES CARBON CORP
Rosita
ROSITA MINE, Rosita, surface, perlite
100-TON MILL, Florence
(See Calif, Nev, N Mex, Oreg)

GREAT NORTHERN URANIUM CO
Uravan
U_3O_8 Prod

GREEN RIVER OIL & URANIUM CO
26 W Broadway, Salt Lake City, Utah
VANADIUM QUEEN MINE, San Miguel County, undergr, U_3O_8
Gen Mgr: Austin B Smith
Supt: Richard Dillon
Prod: 4 tons
(See Utah, Wyo)

GREENLEE, W G
Cortez
U_3O_8 Prod

GREENWALD MNG CO
Box 97, Placerville
EL CAPITAN MINE, San Miguel County, Cu

GRIPE, WOODROW
Naturita
U_3O_8 Prod

GULF COAST WESTERN OIL CO
916 Republic Bldg, Oklahoma City, Oklahoma
DEVEREAUX GROUP, Mesker, undergr, U_3O_8, V
Supt: R E Miller
Frm: Rex Sterry
Prod: 10 tons
(See Okla)

GUM TREE MNG SYNDICATE
c/o E G Robertson, 2360 Cherry St, Denver
GUMTREE MINE, Au

GUNNISON MNG CO
238 N Main St, Gunnison
Pres: Vance E Thornburg
VP: Dr Garth W Thornburg
Sec-Treas: George M Hill
Purch Agt: William R Johnson
LOS OCHOS MINE, approx 23 mi SE of Gunnison, undergr, U_3O_8
Geol: J G O'Brien
Mine Supt: Leslie C Rose
Mine Frm: Frank D Kukich
Mine Eng: William R Greve
Prod: 125 tons

H & H EXPLOR & ENGR CO
Rm 315, 1129 Colorado Ave, Grand Junction
Pres & Gen Mgr: H J McGarr
VP: Wm C Noonan
Sec-Treas: Gene Day Crissman
KANARDO MINE, Gold Brick Mng dist, Ohio City, undergr, Au, Ag, Pb, Zn
Geol: Paul Hopkins
Under devel
(Oper under property management contract)
150-TON FLOT MILL, at mine site

HARDLY ABLE MNG CO
Moab
U_3O_8 Prod

HARTMANN URANIUM CO
1129 Colorado Ave, Grand Junction

HASSELBUSH, RAY & ZIESENISS, HENRY
Box 491, Rifle
MIDNIGHT MINE, 18 mi NE of Meeker, undergr, U, V
Undergr prod

HERLACHER MNG CO
319 W 3rd, Pueblo
Lessee: Victor C Herlacher
PEERLESS 1, 2, 3 MINES, Custer County, Cu

HETZEL, LEE
Clifton
U_3O_8 Prod

HIDDEN SPLENDOR MNG CO, THE
215 N 5th, Grand Junction
(See Utah)

HI - FI DEVEL CORP
1825 Maple Court Ave, P O Box 1587, Grand Junction
Pres & Gen Mgr: Worth W Offutt
VP: L P Laidlaw
Sec-Treas: H E Bell
ROC CREEK & RANDY'S SHAMROCK MINES, approx 9 mi E of La Sal Junct, undergr, open pit, U_3O_8, V_2O_5
Geol: Jess Carruthers
Under devel

HOBBS MNG & DEVEL CO
Box 1923, Hobbs, N Mex
FREELAND EXTENSION, Clear Creek County, Au

HOLDEMAN, E T
Uravan
LONG PARK #6 & #12 MINES, 13 mi SE of Uravan, undergr, U V
Mine Supt: E T Holdeman
Mine Frm: Calvin O'Bryant

HOLLING, HENRY
P O Box 7, Egnar
U_3O_8 Prod

HOLT, HARVEY
Fleming, Utah
U_3O_8 Prod

J M HUBER CORP
P O Box 831, Borger, Texas
U_3O_8 Prod

HUMPHREYS GOLD CORP
910 1st Natl Bank Bldg, Denver 2
Pres: A E Humphreys
VP: I B Humphreys
VP: Jay F Wood (Jacksonville, Fla)
VP & Treas: Judson S Hubbard
Sec: W T Houtatter
(See Fla)

HUNT OIL CO
Grand Junction
URANIUM CLAIMS, San Miguel County, Montrose County, U_3O_8
Under devel
RIDDLE LEASES, Paradox Creek, U_3O_8
(See Utah)

IBEX URANIUM INC
431 Main St, Montrose
Pres: Theodore I Brooks
VP: Jack R Cagle
Sec-Treas: Stewart C Lee
Geol: Max A Krey
MINES & CLAIMS, Montrose & San Miguel Counties, undergr, U_3O_8, V
Under devel
(See Wyo)

IDAHO MARYLAND MINES CORP
Grass Valley, Calif
U_3O_8 Prod
(See Calif, Utah)

IDARADO MNG CO
Ouray
Pres: M B Banghart
IDARADO MINES, 12 mi SW of Ouray on Red Mt 4, Telluride mines at Pandora, undergr, Cu, Pb, Zn, Au, Ag
Gen Mgr: John S Wise
Gen Supt: A C Hilander
Mine Supt: John Kearney
Ch Eng: Jack C Keenan
Prod: 1,800 tons
FLOT MILL, Pandora
Supt: M A Jorgensen
Capacity: 40, 000 tons ore per mo

IDEAL CEMENT CO
500 Denver Nat'l Bank Bldg, Denver
Ch Prod Eng: J C Andrews
OPEN PIT MINE, near Coaldale, Fremont

INLAND DEVEL CORP
3875 E 58th Ave, Denver 16
Pres: E M Stone
VP: H S Dickson
Sec: C H Launer
Treas: Jas D McDonald
BILL & BUD MINE, Coaldale, open pit, U_3O_8
Mine Supt: Wm B Harvey
Asst Mine Supt: Wm Ogden
Under devel

INLAND EMPIRE URANIUM CO
Salida
MINE, Park County, WO_3

INTERMOUNTAIN URANIUM CO
216 Utah Oil Bldg, Salt Lake City, Utah
U_3O_8 Prod

INTERNAT'L MINERALS & CHEMICAL CORP CONSOL FELDSPAR DEPT
20 N Wacker Dr, Chicago 6, Ill
FELDSPAR MILL, Denver
Gen Supt: L W Comer
Prod: 100 tons daily
MICA PLANT, Pueblo, dry grinding
Gen Supt: C M McDaniel
(See Ariz, Fla, Ill, Me, Miss, N Mex, N C, Ohio, Tenn, Va, Wyo)

INTERNAT'L RANWICK LTD
2610-25 King St W, Toronto, Ontario, Canada
Pres: J D Bateman
VP: J M Easson
Sec: A C Callow
Treas: J T McWhirter
MENLOVE-DALTON LEASE, Cortez, undergr, U_3O_8, V_2O_5
Gen Mgr: J D Lowell
Geol: E L Moore
Prod: 15 tons

INTERSTATE MNG & EXPLOR CORP
1036 1st Nat'l Bank Bldg, Denver 2
Pres: S R Mahoney
VP & Treas: L H Seagrave
Sec: W G Dillon
VP: B C Heath
(See Ariz, Nev)

IVANHOE TRUST CO
Kokomo
QUEEN OF THE WEST MINE, Summit County, Au
Mgr: L Deay-Reusch

JARMAN & HADDEN
P O Box 283, Cortez
U_3O_8 Prod

JEFFREY & ULIBARRI
Montezuma
QUAIL, WATERLOO, NEW YORK MINES, Summit County
Idle
SILVER KING MINE, Summit County
PLYMOUTH MILL

JOE DANDY MNG CO
334 Independence Bldg, Colorado Springs
Acting Pres & VP: Vernon Mitchell
Gen Mgr & Treas: A S Kesselman
Sec: C E Yoes
Supt: Harry Allen
JOE DANDY, C O D, COMMONWEALTH, HILLSIDE, CLIMAX VICTORY & SEATTLE MINES, 3-5 mi E of Cripple Creek, undergr, surface, Au

JOHNSON BROS & PRIME
Nederland
BOOSIER MINE, WO_3

HUGO W JOHNSON & CO
P O Box 257, Nucla
U_3O_8 Prod

JOHNSTON MNG CO
2009 E 6th St, Pueblo
Sec: Eugene C Guild
LITTLE JENNIE MINE, Saguache County, Cu

JONES LEAD & ZINC MINES CO
Box 921, Leadville
Own: Robert L Jones
GARIBALDI MINE, 2 mi E of Leadville, undergr, Pb, Zn, Au, Ag
Idle
RESURRECTION #2, 2 mi E of Leadville, undergr, Pb, Zn, Au, Ag
Idle

JOSEPH, ED
Norwood
U_3O_8 Prod

ROY KAMBOLE MNG
Egnar
CHARLES T2, T4 MINES, undergr, U_3O_8, V_2O_5

KANARADO MNG & DEVEL CO
Box 37, Ohio
Pres: Charles Vashus
VP: B V Warren
CARTER MINE, Gunnison County, Au, Ag
Under devel
FLOT-AMAL MILL

KELLY, MARK
Naturita
U_3O_8 Prod

KENDRICK BAY MNG CO
Mines Park, Golden
Pres: Frank Coolbaugh
VP: John J Curran
Sec: John P Fitz-Gibbon
Treas: Thomas E Congdon
(See Alaska)

KERMAC NUCLEAR FUELS CORP
(Owned by Kerr-McGee Oil Industries, Inc; Pacific Uranium Mines Corp, Los Angeles, Calif; Anderson Development Co, Albuquerque, N Mex)
4921 E 38th Ave, Denver 7
Mgr Mng & Mlg: V I Mattson
(See N Mex)

KERR - McGEE OIL INDUSTRIES, INC
4921 E 38th Ave, Denver 7
RESEARCH LABORATORY, MNG & MLG MANAGEMENT HEADQUARTERS
Mgr Mng & Mlg: V I Mattson
(See Ariz, N Mex, Okla, Wyo, and Kermac Nuclear Fuels, Colo, N Mex)

KINGDOM URANIUM & MNG CO
P O Box 246, Aurora 6
Pres & Gen Mgr: Ben J Filla
VP & Treas: N B Filla
Sec: G K Hollingsworth
MINE, open pit, U_3O_8
Under devel

KIRK BASIN URANIUM CORP
2101 Winthrop Ave, Box 9330, Ft Worth, Texas
AUSTIN MINE, 600 Rood Ave, Grand Junction, undergr, U_3O_8, V_2O_5
Mng Eng: Francis X Corbett
Prod: 5 tons
(See Texas)

KOSTELIC, LOUIS
203 W 3rd St, Leadville
BI-METALLIC & FREE COINAGE MINE, Lake County, undergr, Au, Ag, Pb
Prod: 4 tons
20-TON GRAV MILL, Leadville
Mill Supt: Louis Kostelic

L & L URANIUM CO
923 1st Nat'l Bank Bldg, Denver 2
EXPLOR & PROP, various parts of Colo
Idle
(See Wyo)

LA GARITA MINES
P O Box 61, La Garita
CRYSTAL BUTTE LODE, Au

LAKALUCRE MINES, INC
Box 237, Cortez
URANIUM PROP, Under devel

LAKESIDE MONARCH MNG
Marshall Court, Moab, Utah
MARTIN MESA & CARPENTER FLAT MINES, 12 mi N of Uravan, undergr, U_3O_8, V_2O_5
Gen Mgr: Robert E Mahler
Prod: 25 tons
Under devel
(See Utah)

LAMBERTSON, JOHN
Box 567, Gunnison
STAR MINE GROUP, 56 mi N of Gunnison, undergr, Pb, Ag
Under devel

LA SALLE MNG CO
Box 217, Grand Junction
Part: M M Hardin, Roy M Eidal, G T Rummel, MF Rowe
CLUB MESA MINE, undergr, U_3O_8, V_2O_5, Uravan
Co-Mgrs: M F Rowe, G T Rummel
Undergr prod
UNDEVEL MNG PROP, various parts of Colo
(See N Mex, Utah)

LEAD CARBONATE MINES, INC
c/o Henry P Ehrlinger, Box 184, Silverton
LEAD CARBONATE MINE, Ag, Pb, Zn

LEADVILLE LEAD & URANIUM CORP
508 Colorado Bldg, Denver
Pres: Robert G Risk
VP: Harvey Tedrow
Sec: Byron White
Treas: Kenneth Miller

Gen Mgr: James Tiffany
HILLTOP MINES, Fairplay, undergr, Pb, Zn, Ag, Cu, U_3O_8
Under devel

LECLAIR CONS MNG CO
Box 127, Cripple Creek
Gen Mgr: Max W Bowen
MINE, Cripple Creek, Au

LEE & SMALL MNG
432 Main St, Montrose
Stewart C Lee, U A Small, 126 S 3rd St W, American Fork, Utah
Geol: Max Krey
MINES & CLAIMS, Montrose & San Miguel Counties, undergr, U_3O_8
Under devel
(See Utah)

LENR, VERNON
Gateway
MINE, Calamity Mesa, 17 mi E of Gateway on Uncompahgre Plateau, U

LEROY GILES CO
Idaho Springs
Ch Acct: R J Poore
DIXIE #4 MINE, Clear Creek County, Au

LE RU MNG CO
Gen Del, Cortez
U_3O_8 Prod

LISBON VALLEY URANIUM CO
501 Kittredge Bldg, Denver
CHAUTAUQUA MINE, Summit County, Ag, Pb, Zn
MILL, at mine

LITTLE JOHNY MINES INC
400 E 4th Ave, Leadville
PANNY RAWLINGS MINE, Lake County, Ag, Pb, Zn
IBEX OPER NO 2, Lake County, Au

LOMA URANIUM CORP
316 Paramount Bldg, Denver 2
Pres: Carl L Lough
VP: J E Spaulding
Sec-Treas: John R Moran
Purch Agt: D T Hayes
URANIUM PROSPECTS
(See Wyo)

LOST CANYON URANIUM & OIL CO
918 Simms Bldg, Albuquerque, N Mex
LOUISE & KATHRYN MINES, undergr
Idle
(See N Mex)

M & M MNG CO
c/o R G McKinley, Buena Vista
LAST CHANCE MINE, Chaffee County, Au

M & S INC
Salida
Pres: J W Magnuson
Gen Mgr: R H Magnuson
HOMESTAKE MINE, surface, feldspar

MAGDALENA MNG & MLG CO
2040 S Navajo St, Denver 23
Pres: W R Jones
VP & Gen Mgr: R M Conrad
Sec: James C Copen
Treas: Boyd F Daigh
Asst Sec: E Griesinger
(See N Mex)

MAGIC URANIUM CO
P O Box 80, Moab, Utah
U_3O_8 Prod

MALCO EXPLOR CO, INC
(Formerly Uranium Corp of America)
P O Box 26, Los Alamos, N Mex
8 CLAIMS, Lindy Point, Mesa County, near Gateway, U_3O_8
Explor
(See N Mex, Utah)

MARCY EXPLOR & MNG CO INC
Jarvis Bldg, Durango
Pres: S Stokes Tomlin, Jr
VP: Edward M Berge
Sec: Robert M Schell
Treas: Robert R Snodgrass
(See Ariz, Utah)

MARKLEY MNG & EXPLOR CO
Cripple Creek
Mgr: Lee Brown
TENDERFOOT PROPERTY, Au
Under devel

MARTINEZ MEDINA & DOWELL
P O Box 343, Uravan
U_3O_8 Prod

MARY MURPHY GOLD MNG CO
Box 209, Salida
Gen Mgr: W E Burleson
MINE, 4 mi SW of St Elmo, undergr, Au, Ag, Pb, Zn
Prm: Henry Carey
Idle
(Leased to W E Burleson)

MAUPIN, ED
Nucla
U_3O_8 Prod

MAY DAY MNG CO
Box 585, Silverton
Mgr: Ennis Cole
MAY DAY MINE, Ag, Pb, Zn

MAYFIELD, JERRY
P O Box 231, Naturita
U_3O_8 Prod

MAYFIELD, PAGE & NEILSON
P O Box 93, Delta
U_3O_8 Prod

MAYFLOWER MNG & PETROLEUM CO
P O Box 538, Ouray
DOUBLEHEADER MINE, Chaffee County, Ag, Pb, Zn

McCOY AGGREGATES
1641 St Paul St, Denver
NO NAME CRATER, 5 mi NW of McCoy

McCORMICK, WM R
Dove Creek
U_3O_8 Prod

MENA MNG CO
4825 Montview Blvd, Denver 7
Pres & Gen Mgr: Joseph W Walsh
VP: D Ward Sillaway
Sec-Treas: Paul L Schaulis
MENA MINE, Golden, Jefferson County, undergr, U_3O_8, Cu, Ag
Mine Supt: R L James
Mine Frm: Leonard Abbott
Prod: 12 tons

MENDOTA FROSTBURG MNG CO
Stockyard Station, Box 8430, Denver
Pres: D V Watrous
MENDOTA MINE, Clear Creek County, Ag, Pb, Zn

MID-CONTINENT URANIUM CORP
201 Uranium Center Bldg, Grand Junction
Pres: D Lew Williams
VP & Gen Mgr: Norman E Ekbley
Sec-Treas: Mark O Dunn
Purch Agt: John E Danielson
Geol: Coy M Mobley
(See N Mex)

MIDGET MINE CO
Cowdrey
Pres: Walter Symington
MOLYBDENUM NO 1 MINE, Jackson County, Au

MILLER, M E
P O Box 17, Placerville
U_3O_8 Prod

MINERALS CORP OF AMERICA
201 N 5th, Grand Junction
(See Utah)

MINERALS ENGR CO
201 Fourth Ave, Grand Junction
Pres: Blair Burwell
VP: R G Sullivan
Sec: E B Adams
Treas: C A Walt
Purch Agt: Arno Miller
DIAMOND & WAGON DRILLING CONTRACTING
(See Mont, N Mex, Utah)

MINES DEVELOPMENT, INC
Farmers Union Bldg, Denver
(See S Dak)

MNG RESEARCH CORP
4215 Balsam St, Wheatridge
Pres: Clifton W Livingston
VP: J Stirling Livingston
Sec: Helen J Livingston
MINE, undergr, surface, U_3O_8
Gen Mgr: C W Livingston
Geol: B M Herndon
Supt: F J Mocsmin
Under devel
(See S D)

MINING VENTURES
303 Bon Durant Bldg, Salida
VENTURE NO 2, Chaffee County, WO_3

MOLYBDENUM CORP OF AMERICA
Empire
URAD MINE & MILL, undergr, Mo, U_3O_8
Mgr: John B Carman
Under devel
(See Calif, N Mex, N Y, Pa)

MOLLIE KATHLEEN MNG CO
Cripple Creek
MOLLIE KATHLEEN MINE, Au

MONOGRAM URANIUM& OIL CO
214 Petroleum Bldg, Grand Junction
Pres: Ray Baxter
VP & Treas: Geo Dilts
Sec: Edward Nevans
GROUND HOG MINE, Naturita, undergr, U_3O_8, V_2O_5
Gen Mgr: Joseph F Trudgeon
Under devel
(See Utah)

MONOGRASS URANIUM
Naturita
U_3O_8 Prod

MONTEZUMA URANIUM, INC
Montezuma
c/o Tom E Martin & Patrick J Vinson
MINE, Colliey Min, near Montezuma, U_3O_8
Prod
CHATAQUA MINE & MILL
PAY MASTER MINE

MORENO URANIUM CORP
731 Cooper Bldg, Denver
Pres: Dr Edward L Clark
VP: Howard Baisley
Sec-Treas: Ray Bennett
SILVER QUEEN MINE, Silverton, Pb, Zn, Au, Ag
Idle
LEYDEN URANIUM MINE, Lydon, U_3O_8
Idle
(See Utah)

MORGAN MINERALS CORP
765 Denver Club Bldg, Denver 2
Pres: Arnold O Morgan
VP: Howard R Gholson
Sec-Treas: H Schieffer
SUNRISE & PATTY MINES, Nucla, undergr, U_3O_8, V
Gen Mgr: H R Gholson
Supt: James L Capp
Geol: M F Ayler
Prod: 25 tons

P J MOSKAL CO, INC
Breckenridge
Mgr: L M Pastorius
ADMIRAL GROUP, Summit County, Ag, Pb, Zn

MTN STATES OIL & URANIUM CO
726 Univ Bldg, Denver 2
U_3O_8 Prod

MOUNTAIN STATES URANIUM, INC
7340 W Colfax Ave (Suite 6), Denver 15, Colo
Pres & Gen Mgr: James R Manning
Sec-Treas & Asst Gen Mgr: Peter Nelson
Gen Supt: Morris Sydow
Mine Eng: Paul M Hopkins
BUFFALO #1 MINE, Jamestown, undergr, U_3O_8
Under devel

MOUNTAIN TOP MNG & MLG CO
159 Colorado Ave, Grand Junction
LEASES, Montrose County, U_3O_8
(See Utah)

NABOB DEVEL CO
813 Majestic Bldg, Denver
Pres: C R Fromen
VP: G F Critze
Gen Mgr: Chas O Parker
Sec: E M Stuart
NABOB MINE, 3 mi S of Lawson, undergr, Ag, Pb, Au, Cu
Supt: Chas O Parker
Under devel

NATIONAL CONSOL MNG CORP
Box 550, Salida
COCOMONGO MINE, Saguache County, Ag, Pb, Zn

NATOMAS CO
Fairplay
DREDGE #1, Park County, Au, Ag
Local Supt: Webb Skinner
Idle
(See Calif)

NEDERLAND MINES, INC
Office of Sec: 551 Ave of the Americas, New York, N Y
Pres: Carl Rosen
Exec VP & Sec: G A Horvath
CARIBOU MINE, 1405 Pearl St, Boulder, 5 mi W of Nederland, undergr, Ag, Pb, Au
Gen Mgr: Matthew Olivera
Under devel
100-TON FLOT MILL, 6 mi E of Nederland

NEESHAM MNG CO
Nucla
Gen Mgr: Glenn D Needham
BUCKSKIN MINE, Bull Canon, undergr, U_3O_8, V_2O_5
PEGGIE, Sanner Basin, U_3O_8, V_2O_5
Under devel

NEILSON, CLARENCE L
P O Box 454, Telluride
U_3O_8 Prod

NEPTUNE URANIUM CORP
2525 Walnut St, P O Box 637, Denver 1
Pres: W E Griffith
VP & Gen Supt: L A Griffith
Sec: Ray Carson
Treas: Fred Burns
SHAMROCKS, KINGPINE & OTHER MINES, undergr, U_3O_8, V_2O_5
Geol: Paul H Keating
Prod: 2-5 tons
Under devel

NEVADA MINES CO
c/o Walter J Timney, 2001 Pinto Lane, Las Vegas, Nev
CORA GROUP, Saguache County, Ag, Pb, Zn

NEW DOMINION MNG CO
Ophir
Mgr: Randolph Bellele
NEW DOMINION MINE, Ophir, Au, Ag, Pb
GRAV MILL
Idle

NEW IDRIA MNG & CHEM CO
Idria, California
Pres: C Hyde Lewis
Sec-Treas: M A Burgess
URANIUM DIVISION, P O Box 214, Gateway, undergr, U_3O_8, V_2O_5
Div Mgr: Arthur W Goring
JOHNNIE MAE MINE, Beaver, Mesa undergr, U_3O_8, V_2O_5
PACK RAT, SHAKIN QUACKIE & HUBBARD HOMESTEAD MINES, Beaver Mesa, undergr, U_3O_8, V_2O_5
(Leased to Beaver Mesa Uranium, Inc)
(See Calif)

NEW JERSEY ZINC CO EMPIRE ZINC DIV
Gilman
Western Mgr of Mines: Frank J Malott
Supt, Gilman Oper: W L Jude
Plant Chief: Harold Stienmier
Personnel: Frank Sherwood
Accountant: Darrell C Barnes
EAGLE MINE, undergr, Pb, Zn,
Mine Chief: J P Skinner
1,200-TON FLOT MILL
Mill Frm: Foster J Witthaser
(See Calif, N J, N Mex, N Y, Pa, Tenn, Va, Wis)

NEW WORLD EXPLOR, RESEARCH & DEVEL CORP
Texas Creek
TAYLOR MINE, 30 mi W of Texas Creek, undergr, U_3O_8
Idle
(See Calif, Utah)

NEWMAR MNG CORP
P O Box 1569, Grand Junction
Pres & Gen Mgr: Ralph E Simpson
VP: A P Starr
Sec: H L Palmer
Ch Geol & Eng: Robert E Simpson
MICAWBER, AUGUSTA TREASURY MOUNTAIN MINES, Crested Butte, SAN JUAN CHIEF, Ouray, undergr, Pb, Zn, Ag, Cu, Au
Mine Supt: H G Burgess
Under devel

NORBUTE CORP
215 N 5th, Grand Junction
(See Utah, Wyo)

NORTH STANDARD MNG CO
Box 605, Provo, Utah
MINE, BULL CANYON, Naturita, undergr, U_3O_8
Mine Frm: Melvin B Conley
Prod: 15 tons
MILL, Grand Junction
(See Nev, Utah)

NORTHWESTERN MNG & PETROLEUM CO
442 1/2 Main, Grand Junction

OKAN URANIUM CORP
635 Hall Ave, Grand Junction
U_3O_8 Prod

OLD HUNDRED GOLD MNG CO
c/o W G Sandell, Box 448, Silverton
GARRY OWEN MINE, Ag, Pb, Zn

OLIVERS BROS
Norwood
AMERICAN EAGLE MINE, San Miguel County, U_3O_8, V_2O_5

ORTMAYER MNG CO
320 S 1st St, P O Box 1846, Grand Junction
Pres: C G Ortmayer
VP: Hilda Ortmayer
Sec: John Speight
LEGIN LEASE, undergr, U_3O_8, V_2O_5
Gen Mgr: Frank Turman
Mine Frm: W L Ellison
Mine Eng: George Davis

OTTER CREEK URANIUM & MNG CO
Box 184, Silverton
Pres & Gen Mgr: H P Ehrlinger
VP: J F Lacey
Sec: V W Tookey
VALLEY RANCH MINE, undergr, U_3O_8, V_2O_5
Undergr prod

OUTLET MNG CO
Box 35, Creede
Purch Agt: James M Muir
PHOENIX LODE, 3 mi N of Creede, undergr, Pb, Ag, Au
Mine Supt: Gavin W Skinner
Idle

OZARK - MAHONING CO MNG DIV
Box 449, Tulsa, Okla &
Rosiclare, Ill
NORTHGATE MINE, undergr, open pit, fluorspar, Cowdrey
Gen Mgr: R K Wisco
Mine Supt: M P Cloonan
Prod: 335 tons
350-TON FLOT MILL, at Northgate mine
Mill Supt: Gus Paris
EMMETT & AFTERTHOUGHT MINES, undergr, open pit, fluorspar, sulfide concentrate
Contr: H B Williamson
Prod: 120 tons
120-TON FLOT MILL, at Jamestown
Mill Supt: P H Dawson
Mill Frm: W L Kelley
(See Ill, Ky, N Mex, Okla)

PACIFIC INDUSTRIES, INC PLANDERS MNG CO (wholly owned subsid)
Box 861, Grand Junction
Pres: Robert E McDonald
VP: William M Spencer
Sec-Treas: Ronald Bailey
GATEWAY MINES, Gateway, undergr, U_3O_8
Prod: 25 tons
(See Calif)

PACIFIC URANIUM MINES INC
1924 White, Grand Junction
Pres: L Halper
VP: B Silbert
Sec-Treas: I Klubok
Ch Geol: H Redmond
(See N Mex)

PANDORA METALS INC
1555 Dayton St, Aurora
COMSTOCK & PANDORA MINES, Boulder County, Au

PARK CITY CONS MINES CO
Gunnison
Gen Mgr: Nolan Probst
KEYSTONE MINE, Crested Butte, 29 mi N of Gunnison, undergr, Zn, Pb, Cu, Ag
Under devel
(Operated by Amer Smelt & Refin Co-See Utah)

PARKER MNG & DEVEL CO
421 Glenwood Ave, Grand Junction
Pres: Pierre Parker
BEAN PATCH MINE, Slick Rock, undergr, U_3O_8
Gen Mgr: Earl B Murray

PASSIFLORA MNG CO
P O Box 745, Canon City
Pres: Charles A Bilby
VP & Gen Supt: M N Taylor
Sec: J s D Blunt
PASSIFLORA MINES, 1 1/2 mi N of Westcliffe, undergr, Ag, Pb, Cu, Au, U_3O_8
Under devel

PASTORE, JAMES
1946 Walnut St, Boulder
CONGER FLOAT BED, WO_3

PATTERSON, JAMES L
Uravan
U_3O_8 Prod

PENROSE URANIUM CO
701 Midland Savings Bldg, Denver
Pres: F H Bosco
Treas: A C Bosco
URANIUM CLAIMS, various parts of Colo
Under devel
(See Utah)

PERINI MNG CO
215 N 8th, Grand Junction

PETTIGREW WORLEY & REYNOLDS MNG CO
230 W Avery St, Dallas, Texas
U_3O_8 Prod

PHILLIPS, CLAYTON E
P O Box 1175, Rifle
U_3O_8 Prod

POLAND & POLAND
P O Box 357, Grand Junction
U_3O_8 Prod

PORTER & CO
P O Box 554, Uravan
U_3O_8 Prod

PRAIRIE DIVIDE URANIUM CO
231 S Grant Ave, Fort Collins
Pres: T H Sackett
VP: Jas H Andrews
BLACK HAWK #1 & #2, Fort Collins, undergr, U_3O_8
Idle

PRICE EXPLOR CO
Grand Junction
U_3O_8 Prod

PRIDE OF THE WEST, INC
Box 422, Silverton
Agent: C Leslie Larson
PRIDE OF THE WEST MINE, San Juan County, Zn, Pb, Ag, Au
Idle

PRIMM, GEO & JOHNSON BROS
Nederland
HOOSIER MINE, Boulder County, WO_3

PYRAMID URANIUM LTD
608 Rood Ave, Grand Junction
Gen Part & Gen Mgr: K Dean Butler
Geol: Fred C Ikeme
(See Utah)

RADIUM HILL URANIUM
Nye Bldg, Montrose
Pres & Gen Mgr: Homer Noble
VP: Willard Leighton
Sec: Corwin Palmer
(See Utah)

RAINBOW PLACER, INC
2644 Depew St, Denver
Pres: Dan C Harrington
VP: R V Seeton
Sec: Martha V Keene
PLACERS, Tin Cup, Gunnison County, Au, Ag
Idle

REALTY URANIUM & MNG CO, THE
937 U S Nat'l Bank Bldg, Denver 2
Pres: Thomas M Dines
VP: Frank Ricketson III
Sec: John N Meade
Treas: Chandler Weaver
CALHOUN GROUP, WOOD, BEZANT MINES, Box 186, Central City, Gilpin County, undergr, Au, Ag, Cu, Pb, U_3O_8
Supt: Henry Ross
Eng: Ray A Bennett
Under devel & prod
(See Utah)

REED, GORDON
Naturita
U_3O_8 Prod

RESURRECTION MNG CO (Subsid of NEWMONT MNG CORP)
Box 936, Leadville
Pres: Plato Malozemoff
Purch Agt: F R Bockstey
IRENE & JULIA FISK MINES, undergr, Pb, Zn, Cu, Au, Ag
Gen Mgr: B B Groesbeck
Gen Supt: R F Sheldon
Geol: G W H Norman
Elec Eng: D G Ainsworth
Mine Frm: C N Stout
Prod: 400 tons
450-TON FLOT MILL, California Gulch
Mill Supt: G A Johnson
Mill Frm: A Kuss, Sr
Assayer: Frank Finch
(See NY & Newmont Mng Corp, N Y)

REY URANIUM CORP
Box 1338, Farmington, N Mex
Pres & Gen Mgr: R J Scanlon
ADAK & EQUINOX MINES, Uravan, undergr, U_3O_8, V_2O_5
Mine Supt: Stan Reed
Prod: 80 tons
(See N Mex)

REYNOLDS MINERALS CORP
1028 1st Nat'l Bank Bldg, Denver 2
Pres: D J Lockhurst
VP & Gen Mgr: G C Ridland
JO REYNOLDS MINE, Lawson, undergr, Ag, Pb, Zn
Gen Supt: Alexander H Babb
Geol: C C Kugel
100-TON FLOT MILL, Dumont
SMELTER, Leadville
(See N Y)

REYNOLDS MNG CORP
Poncha Springs
MINE, undergr & surf, fluorspar
MILL
Idle
(See Ark, Va)

REYNOLDS TUNGSTEN CORP
1036 1st Nat'l Bank Bldg, Denver 2
DOZIER MINE, Lawson, WO_3
Gen Mgr: G C Ridland
Under devel
GRAY MILL

RICO ARGENTINE MNG CO
132 S Main, Salt Lake City, Utah
Pres: Sherman B Hinckley
VP: J C Johnson
Sec: L J Lerwill
Treas: B B Hall
Purch Agt: Charles Seiler
MT SPRINGS & ARGENTINE MINES, Box 7, Rico, undergr, open pit, pyrite, Pb, Zn, Ag
Gen Mgr: Sherman B Hinckley
Gen Supt: J J Seerley
Mine Supt: Paul Boeshart
Mine Frm: R E Leber, Ralph VanArsdale
Mine Eng: George Kyler
Surface Frm: Bill Froman
Master Mech: Bob Christiansen
Supply Supt: Albert Chandler
Prod: 150 tons lead-zinc
1,000 tons pyrite
150-TON FLOT MILL, at mine
Mill Supt: Bill Murphy
Assayer: Charles Teller
1,000-TON PYRITE BENEFIC PLANT
150-TON SULFURIC ACID PLANT at mine
Supt: Wayne Gailus
(See Utah)

ROCKY MOUNTAIN STANDARD INC
Box 187, Boulder
Pres: Howard J Anderson
VP: Hugh Bolinger
Sec-Treas: Charles E Williams
Mgr: Harry Culver
URANIUM UPGRADERS & OIL OPERATORS
Under devel

ROSARIO EXPLOR CO
Electric Bldg, Grand Junction
(Subsid of New York and Honduras Rosario Mng Co)

SABRE - PINON CORP
103 Botsun Bldg, Santa Fe, N Mex
Pres: Hugh M Craigie
VP: Charles C Green, Jr
Sec: W L Leeds
Treas: W R Montgomery
URANIUM PROPERTIES, Bull Canyon dist, Montrose & San Miguel Counties, Beaver, Mesa, Gateway dist, Mesa County
Explor
(See N Mex)

ST ANTHONY URANIUM CORP
749 Main St, Grand Junction
Pres: Frank Coolbaugh
VP: Wallace Macgregor
Sec: John P Fitz-Gibbon
Treas: Thomas E Congdon
URANIUM EXPLORATION, N Mex
(See N Mex)

ST REGIS URANIUM CORP
2385 S Jackson St, Denver
Pres: E B Brennan
VP: Thomas Kanzis
Treas: Neil Horan
Sec: T K Brennan
LONE PINE MINE, Montrose County, undergr, U_3O_8, V_2O_5
Gen Mgr: E B Brennan
Mine Supt: Delbert Dyer, Louisa
Prod: 15 tons

SALLY BARBER MNG CO
Gen Mgr: Mike Vinson
Asst Mgr: Pat Vinson
CHAUTAUQUA MINE, 8 1/2 mi SW of Montezuma, undergr, Pb, Ag, Cu
Prod: 20 tons
Mine Supt: Fred Harris
Mine Eng: Bill Kelly
60-TON FLOT MILL, Montezuma
Mill Supt: Mike Vinson
Assay: W H Smith

SAMSON URANIUM, INC
901 Sherman St, Denver
Pres: John A Alderman
VP: Vincent Schelm
Sec: Milton Borger
Treas: Robert T Martin
Purch Agt & Gen Mgr: Tom E Martin
(See Utah)

SAN JUAN LEASING CO
c/o Grover Williams, Uravan
U_3O_8 Prod

SAN JUAN MNG & DEVEL CO
Nederland
Pres: Chas H Turner
VP: Philip F Icke
Sec: Sam D Walter
SAN JUAN MINE, Ophir, undergr, Cu Ag, Pb, Au
Gen Supt: Randolph Bellatt
Geol: Dr G C Ridland
Prod: 25 tons, from devel only
Under devel
(Under lease to Cataract Mng Co)

SAN MIGUEL URANIUM INC
230 N 3rd St, Grand Junction
U_3O_8 Prod

SEABOARD OIL & GAS CO
(See Subsid SOCORRO URANIUM CORP)

SESAME MNG CO
528 1/2 Main, Grand Junction

SHATTUCK DENN MNG CO
Box 878, Uravan
Gen Mgr: Thomas W Newell
Gen Supt: Frank V Garrett
Purch Agt: Jack D Hill
SHATTUCK DENN MINE, undergr, U_3O_8, V_2O_5
Prod: 70 tons
(See Ariz, N Y)

SHENANDOAH - DIVES MNG CO
Silverton
Res Mgr: Edwin A Larson
MINE, 5 mi E of Silverton, undergr, Pb, Zn, Cu, Au, Ag
Mine Supt: John Holmgren
750-TON GRAV-FLOT MILL
2 mi from Silverton
Idle
(See Mo)

SHIPROCK INDUSTRIES, INC
3825 Willat Ave, Culver City, Calif
Pres: John F Sullivan
VP: O J Lilly
Sec-Treas: L B Chandler
MINE, Box 481, Boulder, undergr, WO_3
Gen Supt: George Jump
(See N Mex)

SHUMWAY, LARRY & BOB
Moab, Utah
U_3O_8 Prod

SIERRA ANCHA MNG CO
740 Main St, Grand Junction
(See Ariz)

SILVER BELL MINES CO
633 Guaranty Bank Bldg, Denver 2
Pres & Gen Mgr: E B Sanders
VP: E J Nord
Sec: Jack O Brown
SILVER BELL & CARBONERO MINE, Ophir undergr, Au, Pb, Ag, Cu
Gen Supt: Lesley E Smith
Under devel

SILVER BULL MNG
771 S Santa Fe, Pueblo
BIG FOUR, Summit County, Au

SILVER KING MNG & MLG ENTERPRISES
c/o R L Kahl, 11937 E Colfax Ave, Aurora
BRIGHTON DUMP, Clear Creek County, Ag, Pb, Zn
SILVER KING MILL

SILVER SHIELD MNG & MLG CO
704 Newhouse Bldg, Salt Lake City 1, Utah
Pres: Mary Kyto Ellsworth
VP & Gen Mgr: L E Stein
Sec: Samuel Hernstein
Gen Supt: Phil W Page
MINE, Box 544, Ouray
250-TON CUSTOM FLOT MILL
(Leased)

SIMPSON MNG CO
502 Main St, Grand Junction
URANIUM EXPLOR

SKALLA, A F
Uravan
Gen Mgr: A F Skalla
MONOGRAM MINES, 10 mi S of Uravan, undergr, U, V
Prm: J R Skalla
PAWN SPRINGS MINE #9 & 13, undergr, U, V
Under Devel
ANDIA MAY & DOG TAIL MINES, Montrose County, U

SKIDMORE MNG CO
Box 558, Dolores
Pres: T H Skidmore
VP: G H Skidmore
Sec: H S Pack
LEGIN GROUP, undergr, U_3O_8, V_2O_5
Asst Gen Mgr: A L Skidmore
(See Utah)

SLAGTER EXPLORATION CO
9 Main St, Evansville, Ind
MINE, Box 243, Dive Creek, 15 mi SW of Dove Creek
Mine Supt & Purch Agt: Wm Barbre

SMART, O E
Naturita
U_3O_8 Prod

SMITH & RUGG
Boderland
RAMBLER MINE, Boulder County, WO_3

SMUGGLER MNG CO
Georgetown
SMUGGLER MINE, Clear Creek County, Au

SOCORRO URANIUM CORP
(Wholly owned subsid of Seaboard Oil & Gas Co)
727 Cooper Bldg, Denver
Gen Mgr: Don Wright
Asst Gen Mgr: C Wright
Gen Supt: C C Sterns
JETER (LADRONE) MINE, Socorro County, open pit, U_3O_8, V_2O_5
Prod: 50 tons
(See N Mex, and Seaboard Oil & Gas Co, Tex)

SOUTH MT MNG CO
c/o Frank E Siegfried, 447 Washington St, Monte Vista
GOLD LINK MINE, Rio Grande County, Au

SOUTHWESTERN OIL & URANIUM
El Rio Rancho Motel, Grand Junction
U_3O_8 Prod

SPRAY, EDWIN C
1527 Washington St, Denver 3
SWEET HOME MINE, Alma, undergr, Ag, Cu, Pb

SPRING DAY MNG CO
Box 306, Central City
Pres & Gen Mgr: William E Landan
Sec-Treas: James H Austin
DAY SPRING & SPRING DAY MINES, 1 1/2 mi SW of Central City near head of Leavenworth Gulch, undergr
Geol: Niles Grosner
Mine Supt: William E Landan
Asst Mine Supt, Garry Danbo
Under devel
42-TON FLOT GRAV MILL, lower Russell Gulch
Under const

SPRINGER, D P
Naturita
U_3O_8 Prod

STAATS & HIGHTOWER
Naturita
U_3O_8 Prod

STERRY BROTHERS
Meeker
U_3O_8 Prod

STEWART, JAMES
Egnar
U_3O_8 Prod

STRATEGIC MINERALS EXPLOR CO
P O Box 1648, Grand Junction
Managing Part: John I Schumacher
Oil & Met Dept: H C Anderson
URANIUM EXPLOR, Red Canyon, East Canyon & LaSal Creek

STRATTON CRIPPLE CREEK MNG & DEVEL CO
Box 178, Colorado Springs
Pres: D F Strickler
VP: H L Stubbs
Sec-Treas: Kenneth Brown
MINES, under lease

STURM MINING CO
Rt 12, Box 2536, Grand Junction
Pres & Gen Mgr: Fred Sturm
VP & Purch Agt: Leona Sturm
Sec-Treas: Don E Sturm
Mech-Eng: Wesley Sturm
Safety Eng: Lewis Sturm
ELIZABETH GROUP, Mesa Creek, 64 mi SW of Grand Junction, surface, U_3O_8, V_2O_5

SUSAN B URANIUM CORP
34 Prospectors Lodge, Moab, Utah
MINES, undergr, surface, U_3O_8, WO_3
(See Ariz, Utah, Wyo)

SYLVANIA MNG & MLG CO
1114 Security Bldg, Denver
GOLDEN ROSE MINE, La Plata County, Au

TALL TIMBER MNG CO
c/o L R Bisman, 900 Grant St, Denver
MINE, near Indian Hills, feldspar, Be, mica U_3O_8
Under devel

TALLAHASSEE URANIUM CORP
P O Box 700, Canyon City
U_3O_8 Prod

TANTALIZER MNG CORP
3134 Edgewater Dr, Albany, Ga
TANTALIZER MINE, Fremont County, Cu

TECH SER MNG CO
Box 517, Silverton
LUCKY JACKS GROUP, OSCEOLA SILVER LEDGE, San Juan County, Ag, Pb, Zn

TERMINAL EXPLOR CO
810 Rood Ave, Grand Junction

TEXAS - ZINC MINERALS
626 Rood Ave, Grand Junction
(See Utah)

THORNBURG MNG CO
140 W Main, Grand Junction

THORNBURG URANIUM MINES, INC
160 W Main St, Grand Junction
Pres: Vance Thornburg
VP-Sec: Garth Thornburg
Off Mgr: Terry E Weldon
LOS OCHO PROP, Gunnison County, U_3O_8
Producing
(See Utah)

THUNDERBIRD URANIUM CO
P O Box 1486, Salt Lake City, Utah
U_3O_8 Prod
(See Utah)

TORRES, DAVID
Monticello, Utah
U_3O_8 Prod

TRACE ELEMENTS CORP
Box 1135, Grand Junction
Pres: Bruce Brownson
VP: C L Walker
Sec: B A Kellogg
MAYBELL PROJECT, Maybell, undergr, surface, U_3O_8
Gen Mgr: R C Cutler, George E Morehouse
Supt: J A Travelli
Geol: J O Shaw
Met (Consult): John L Chapman
Prm: Don H Seeley
Under devel & prod

TRANS - MOUNTAIN URANIUM CO, INC
2340 Hiway 24, Colorado Springs
Pres: Standley P Balcomb
VP: Raye L Benham
Sec: Vera M Balcomb
Treas: Howard M Gray
Counsel: R B Murray
Dir: J A Gerber, C H Long, R D Prigmore
BENHAM MINE, LINDY POINT UNIT, Gateway, undergr, surface, U_3O_8, V
Gen Mgr: Standley P Balcomb
Asst Gen Mgr: Clyde H Long
Gen Supt: Ted Boothe
Asst Supt: Charley Naught
Under devel

TREASURE MOUNTAIN GOLD MNG CO
202 Midland Savings Bldg, Denver 2
Pres: Guy L V Emerson
Sec: A W Fischer
SANDIAGO, SAN JUAN, QUEEN, GOLDEN FLEECE & SCOTIA MINES, 11 mi NW of Silverton, undergr, Au, Ag, Pb, Zn, Mn
Under devel

TREASURY VAULT URANIUM CORP
718 Symes Bldg, Denver
Pres: Ben L Wright, Jr
VP: LeRoy A West
Sec: David J McKee
Treas: Delbert R Peterson
Gen Mgr & Purch Agt: Robert R Hale
Eng: John G Freeman
CHAMPAIGN & CONEY MINES, Fairplay, undergr, U_3O_8
Under devel

TRI - EM CORP
Main Ofc: 524 Cooper Bldg, Denver 2
Oper Ofc: Box 105, Villa Grove
Pres: O R Osmundson
CLIFF & JUPITER MINES, Villa Grove, Au, Ag, Pb, Cu
Gen Mgr: D W Schmitt
Asst Gen Mgr: Joe Osmundson
Mine Supt: F W Burger
50-TON FLOT GRAV MILL, Bonanza, Kerber Creek dist
Mill Supt: Clinton C Anderson
Assayer: John DeVall

TRIPLE "O" URANIUM MNG CO
Aspen
Pres: William C Orschein
VP: Frank Westlake
Treas: Donald W Orschein
Gen Mgr & Purch Agt: Edwin C Arbar
LONGNECKER MINE, Ashcroft, undergr, Pb, Ag, Cu, Au
Mine Supt: E W Arbar
(See Mo)

TUNGSTEN MNG CO, INC
420 Pine St, Boulder
Pres & Treas: George W Cowdery
Sec & Geol: William H Cowdery
TUNGSTEN MINE, Boulder, undergr, WO_3
Prod: 194 tons in 1956

TURNER, JACK C
P O Box 58, Moab, Utah
U_3O_8 Prod

TWIN ARROW PETROLEUM CO
1st Nat'l Bank Bldg, Denver
U_3O_8 Prod
Under devel

UNCOMPAHGRE URANIUM, INC
Box 114, Grand Junction
Pres: John Gaskill
VP: Ken Weaver
Sec-Treas: John Horan
DEER TRAIL MINE, Pawn Creek, 23 mi E of Meeker, undergr
Supt: Ken Weaver
Prod: 5 tons

UNION CARBIDE NUCLEAR CO(A div of UNION CARBIDE & CARBON CORP)
Electric Bldg, Grand Junction
Gen Mgr Colo Plateau: J L Lake
Mgr of Plants: J F Brenton
Mgr of Mines & Explor: J P Emerson
Ch Geol: J E Motica
Met: D C Seidel
MINE, Uravan, undergr, U_3O_8, V_2O_5
Supt: J R Borden
MINE, Green River, undergr, U_3O_8, V_2O_5
Supt: G B Irvine
MINE, Maybell (Trace Elements Corp), undergr, U_3O_8, V_2O_5
Supt: M W Scott
CHEMICAL MILLS, Rifle, Uravan
Mill Supt: H C Peterson, Rifle
R D Van Zante, Uravan
MILLS, under constr at Green River, Slick Rock, Maybell
Mill Supt: D M Pembridge, Green Riv
J P Sanders, Slick Rock
K W Lentz, Maybell
(Trace Elements)
(See Calif, N Y)

UNION GULF OIL & MNG CORP
2701 U S Hwy 50, Grand Junction
ST JOHN SILVER MINE, near Montezuma, Summit County
CLAIMS, Saguache County
(See N Mex, Utah)

UNITED GOLD MINES CO
Box 127, Cripple Creek
Pres: M E Shoup
VP & Gen Mgr: Max W Bowen
Gen Supt: C H Carlton
VINDICATOR & PORTLAND MINES, Victor, undergr, Au, Ag

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
QUARRY, Loveland, gypsum, open pit
Works Mgr: J R Miner
(See Calif, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Tex, Utah, Va)

U S LITHIUM CORP
1205 Walker Bank Bldg, Salt Lake City, Utah
BROWN DERBY & TUCKER MINES, Gunnison County, undergr, lepidolite, spodumene
Gen Mgr: Paul T Walton
Gen Supt: Charles T Vashus
(See Utah)

U S METALS CORP
c/o Alfred O Brehmer, 310 Mercantile Bldg, Denver
JOE, & JOHN, HENRIETTA MINES, San Juan County, Ag, Pb, Zn

UNITED URANIUM CORP
1608 Broadway, Denver 2
Pres: Ray Fahnlender
VP: Edgar Payton
Sec-Treas: R H Foster
PICO 3 MINE, U_3O_8, V_2O_5
Under devel (lease agreement)

UNIVERSAL OIL & URANIUM CO
7900 W Colfax Ave, Lakewood
RED ELEPHANT GROUP, Clear Creek County, Ag, Pb, Zn

URANIUM CORP OF AMERICA
Box 26, Los Alamos, N Mex
FIELD OFFICE, Cortez
CLAIMS, Dolores County, Rico area
Under devel

URANIUM DEVEL CORP
Golden
Mgr: Paul Keating
U_3O_8, Under devel

URANIUM ENTERPRISES
2879 Arapahoe, Boulder
Gen Mgr: Elliot Goldstein
MANN #1 MINE, Morrison, undergr, U_3O_8
Mine Supt: Tom Getner
Prod: 20 tons

URANIUM EXPLORERS SYNDICATE
645 Emerson St, Denver
Gen Mgr: J Broomfield
URAMINITE, CORVUSITE claims in Mesa and San Miguel counties
Under devel

URANIUM INDUSTRIES INC
132 S 4th, Grand Junction
(See Utah)

URANIUM METALS, INC
Egnar
FALCON URANIUM MINE, Bishop Canyon, Montrose County
Ch Eng: Dr A A Zangara
U_3O_8 Prod

URANIUM PRODUCERS, INC
Egnar
Mgr: Harry E Coppin
URANIUM MINE, Slick Rock dist, Montrose County

URANIUM PROSPECTORS CO, LTD
718-N 5, Grand Junction
U_3O_8, Under devel

URANIUM QUEEN EXPLOR CO
823 1/2 10th St, Greeley
URANIUM QUEEN MINE, Larimer County, U_3O_8

UTACO URANIUM CORP
Box 113, Moab, Utah
BRADLEY MINE, San Miguel County, Ag, Pb, Zn
SILVER SHIELD MILL, Ouray

UTARADO MNG CO
P O Box 287, Montrose
U_3O_8 Prod

UTCO URANIUM CORP
310 1st Nat'l Bank Bldg, Denver
Pres: Geo S Casey,
VP: Fred C Clymer
Sec: H Clark Thompson
Treas: John Aliff
Asst Treas: J D Vander Ploeg
Gen Mgr & Geol: Mason W Rankin
(See Ariz, N Mex, Utah)

UTIDA CO
P O Box 58, Moab, Utah
U_3O_8 Prod

VANADIUM CORP OF AMER
Durango
VP & Gen Mgr: D W Viles
MINES, 200 sq mi area on Colorado Plateau, undergr, open pit, V_2O_5, U_3O_8
Mines Auditor: John W Blackburn
DURANGO PERSONNEL
Geol: E E Wauters
Mech Eng: C T Newland
Elec Eng: Leroy Parker
Dir of Plateau Oper: Page Edwards
Mine Supt: W W Wittmeyer
Mine Frm: W Q Weaver
Mine Eng: Harry Jessing
NATURITA PERSONNEL
Geol: Jack L Gexham
Mine Supt: R L Anderson
Mine Frm: J W McNeely, Marion J Cox
Mine Eng: Hilary Tanner
MILL, Durango, roast leach
Mill Supt: J A Maxwell
Asst Mill Supt: Dale Prior
Assayer: R G Vesper
MILL, Naturita, roast leach
Mill Supt: L A Daniels
Asst Mill Supt: Don King
(See Ariz, N Mex, N Y, Utah)

VANADIUM QUEEN URANIUM CORP
P O Box 1674, Grand Junction
Pres: Don Danvers
Sec-Treas: Duck Harrison
VANADIUM QUEEN MINE, La Sal Creek, undergr, U_3O_8, V_2O_5
Res Eng: John I Schumacher
Prod: 30 tons
(Oper under contract by Joe Pitts, 133 W Mesa, Grand Junction)

VANURA URANIUM, INC
Marshall Court, Moab, Utah
Field Supervisor: Everett Blackburn
QUARREL MINE, Dull Canyon, Montrose County, undergr, U_3O_8, V_2O_5
Mine Supt: Lee Elder
CROWN PRINCE, Martin Mesa, Montrose County, undergr, U_3O_8 V_2O_5
Mine Supt: Philip Klingensmith
Prod: 10 tons
Under devel
(See Utah)

VENTURES, INC
304 Main St, Grand Junction
U_3O_8 Prod

VILLA GROVE TURQUOISE MINE
Villa Grove
LODE, Saguache County, Turquoise

VULCAN SILVER LEAD CORP
100 Park Ave, New York 17, N Y
INDIAN CREEK PROSPECT, Gunnison, undergr, U_3O_8
Gen Mgr: J E Dunn
Gen Supt: R J Flynn
Geol: Dr Arthur Baker III
Under devel
(See N Y)

WAH CHANG CORP
Box 441, Boulder
50-TON GRAV MILL, Sugar Loaf Road, Boulder
Rep in charge: Earl G Sweeney
50-TON FLOT GRAV MILL, Sugar Loaf Rd, Boulder
(See Calif, Nev & E A Schols & J H Canier, Ariz)

WALKER ENGINEERING CORP
813 Dooly Bldg, Salt Lake City, Utah
HAP HAZARD MINE, Lake County
Idle
(See Idaho, Utah)

WATTERS, MARION R
Rte 1, Colores
U_3O_8 Prod

WEEMS - WEAVER MNG CO
Box 209, Salida
ANTORO MINE, Box 387, Salida, undergr, Au, Ag, Pb, Zn, Cu
Idle
(Leased to W E Burleson)

WESTERN FELDSPAR MLG CO
Box 671, Salida
Sec-Treas: J W Magnuson
PLANT, near Salida, feldspar

WILLIAMS MINING CO
Norwood
U_3O_8, Under devel

WORCESTER MINES
1501 White Ave, Grand Junction
MINE, near Urevan, undergr, U_3O_8, V
Mng Part: John W Hill
Frm: Dale Clark

WRIGHT BROTHERS
Uravan
PROD CLAIM, Uravan area, U
Idle
(Leased to U S Vanadium)

WRIGHT, WARREN
Rt 4, Grand Junction
MINE, 60 mi SW of Grand Junction, undergr, U_3O_8, V_2O_5
Under devel

WYCOL MINERALS INC
Saguache
U_3O_8, Under devel

YANKEE CANUCK URANIUM CORP
201 N 5th, Grand Junction

YANKEE URANIUM CO
721 Judge Bldg, Salt Lake City, Utah
U_3O_8
Under devel

YOUNG CLAIBORNE & YOUNG
3320 N Virginia, Colorado Springs
U_3O_8
Under devel

ZIMMERMAN, BEN
1302 Main St, Grand Junction
U_3O_8 Prod

ZODOMOK MINES, INC
Box 452, Durango
Pres: Karle S Goff
VP: Kenneth Briselden
Sec-Treas: Donald M DeLuche
BESSIE G MINE, undergr, Au, Ag
Prod: 50 tons
50-TON FLOT GRAV MILL, La Plata Canyon
Mill Supt: Karle S Goff

CONNECTICUT

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
FALLS VILLAGE MINE, Falls Village, open pit, limestone
Works Mgr: C P Svehla
(See Calif, Colo, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Texas, Utah, Va)

DELAWARE

E I DU PONT de NEMOURS & CO
Pigments Dept, 1007 Market St, Wilmington
(See Humphreys Gold Corp, Fla)

FLORIDA

AMERICAN AGRI CHEM CO
Pierce
MINES, Pierce, Polk County, phosphate rock
Gen Mgr: F R Bergquist
Gen Supt: J S Gruel
Mech Eng: H R Quina
Mine Supt: N M Faulds
FLOT MILL, at mine
(See N Y)

AMERICAN CYANAMID CO
30 Rockefeller Plaza, New York 20, N Y
Pres: K C Towe
Sec: R S Kyle
Treas: G C Walker
Dir of Purch: H K LaRowe
Mgr of Phosphate Oper: Arthur Crago
Asst Mgr of Phosphate Oper: F L McDonald
Mines Mgr: E M Haynsworth
Devel Supt: J L Weaver
Mech Supt: W B Anderson
Met: R C Timberlake
Elec Supt: H L Davis
Ch Eng: W J Pace
ORANGE PARK MINE, Brewster, Park area, open pit, phosphate
Mine Supt: F A Vogler
Prod: 3,500 tons
Under devel
ORANGE PARK FLOT MILL
Mill Supt: W F Boyd
SADDLE CREEK MINE, Brewster, Saddle Creek area, open pit, phosphate
Mine Supt: F A Vogler
Prod: 12,000 cu yds Matrix
3,700 tons phosphate rock
6,200-TON SADDLE CREEK FLOT MILL
Mill Supt: W F Boyd
SYDNEY MINE, Brewster, Acco area, open pit, phosphate
Mine Supt: C B Duke
Prod: 12,000 cu yds Matrix
3,000 tons phosphate rock
4,400-TON SYDNEY FLOT MILL
Mill Supt: Grady Barnett
(See Ark, Ga, Va)

ARMOUR FERTILIZER WORKS, INC
Bartow
MINE, Bartow, phosphate

CAMP PHOSPHATE CO
Hernando
Phosphate

CONTINENTAL MINERAL PROCESSING CORP
1st Nat'l Bank Bldg, Cincinnati 2, Ohio
Pres & Gen Mgr: Frederick A Hauck
MINE, Brevard County, rutile, ilmenite, zircon, garnet
Prod: 70 tons
(See Ohio)

CORONET PHOSPHATE CO, A DIV OF SMITH - DOUGLAS CO, INC
Box 790, Plant City
Pres: R S Rydell
Sec: W R Mowen
Purch Agt: G W Johnson
TENOROC MINE, Polk County, near Auburndale, open pit, phosphate rock
Gen Mgr: R M Wilbur
Gen Supt: W H Taylor
Dir Research: C A Hollingsworth
Mine Supt: L G Wood
Mine Eng: R J Stockton
FLOT MILL at mine, washing & screening
Mill Supt: C E Mills

DAVISON CHEMICAL CO A DIV OF W R GRACE & CO
Florida Phosphate Div
Box 471, Bartow
Gen Mgr: W R Port
Prod Supt: J D Clary
Recov Supt: J N Pryor
Mgr, Prod Plan: J L Hunter, Jr
Purch Agt: W W Thornton
Ch Chem: C D McDowall
Ch Eng: A J Frost
Elec Eng: W W Merkel
Geol: E R Scharar
Plant Eng: B W Johnson
Project Eng: C H Greene
Field Eng: T L Nelson
Mines Plan: M P McArthur
Safe Eng: J R Terry
Gen Mines Supt: B P Jones
Phosphate Rock Maint Supt: E J Purcell
Triple Maint Supt: D W Flagler
Prod: 18,000 tons daily
BONNY LAKE MINE, Bartow surface phosphate
Supt: W A Allen
PAUWAY #4 MINE, Bartow, surface, phosphate
Supt: F H Elliott
Chem Plant Supt: D L Brooke
FLOT MILL, Ridgewood
Mill Supt: C B Blood
Asst Mill Supt: L L White
ROTARY KILN & DRYERS
(See Md)

THE FLORIDA MINERALS CO DIV OF HOBART BROS CO
Box 1597, Vero Beach
Pres & Gen Mgr: H W Van Ausdal
Purch Agt & Gen Supt: Sterling Dangler
MINE, Winter Beach, open pit rutile, zircon, ilmenite
MILL, at mine

FLORIDIN CO
Tallahassee
MINES, Quincy & Jamieson, surface, fuller's earth
MILLS

GLOBE PHOSPHATE CO
Dunnellon

HEAVY MINERALS CO
4000 N Hawthorne Ave, Chattanooga, Tenn
Pres: J C Ward, Jr
VP: E E Wyatt
Sec: K L Karr
Treas: R T Ruder
Gen Mgr: H C Laird
COASTAL SANDS DIV MINE, Box 1097, Panama City, placer, rutile, ilmenite, zircon, kyanite
Asst Gen Mgr: O G Alexeio, Jr
Geol: W H Suhr
Project Eng: O E Aiken
Under devel

HOWARD PHOSPHATE CO
Box 7028, Orlando
Gen Mgr: R M Howard
MINE, Inverness, surface, 300-ton bucket dredge, soft, colloidal & hard phosphate
Mine & Mill Supt: W E Marlow

HUMPHREYS GOLD CORP
Box 5492, Jacksonville 7
VP: J P Wood
JACKSONVILLE PLANT, Box 5492, Jacksonville, 8 miles E of Jacksonville, placer, ilmenite, rutile, zircon, monazite
Mgr: F McKinley
Supt: H Lewis
Asst Supt: A D Whisler
Eng: J Elledge
Cont: S L Jackson
GRAV MILL
HIGHLAND PLANT, (office), Drawer A, Lawtey & TRAIL RIDGE PLANT, (office), Drawer 672, Starke
Mgr: E C Weichel
Met: J C Detweiler
Cont: S L Jackson
HIGHLAND PLANT, 1 mi E of Lawtey, open pit, ilmenite
Supt: L S Beebe
Mine Supt: W C Coran
Mine Eng: J L Hetherington
TRAIL RIDGE PLANT, 6 mi E of Starke, open pit, ilmenite, zircon, staurolite
Supt: W J Sipprelle
Mine Supt: C J Pendrick
Mine Eng: J F Mulling
GRAV MILL
(See Colo)

INTERNATL MIN & CHEM CORP
PHOSPHATE MIN DIV
20 N Wacker Dr, Chicago 6, Ill
Bartow, Fla
PHOSPHATE MINES, Achan, Noralyn, Peace Valley
Prod Mgr: F B Bowes
Mgr: E T Casler
Asst Mgr, Prod: H T Loehr, Jr
Asst Mgr, Eng: W O McClintock
(See Ariz, Colo, Ill, Me, Miss, N Mex, N C, Ohio, Tenn, Va, Wyo)

KELLOGG CO
920 Franklin St, Ocala
PHOSPHATE MINE

KIBLER -CAMP PHOSPHATE ENTERPRISE
Box 608, Ocala
Treas: Taylor Scott
Purch Agt: T D Felton
SEC 16 MINE, Dunnellon, open pit, hard rock, phosphate
Gen Mgr: D B Kibler, Jr
Asst Gen Mgr: Clarence Camp II
Gen Supt: T D Felton
Mine Supt: N T Farrell
Prod: 350 tons

KNIGHT & DEVIS
Dunnellon
Phosphate

LONCALA PHOSPHATE CO
Box 338, High Springs
PHOSPHATE MINE, Fort White Mesa

RUTILE MNG CO OF FLORIDA
111 Broadway, N Y 6, N Y
Pres: Chas C Norris, Jr
VP: John Ross
Sec: A J Drexel Paul, Jr
Treas: Peter E Connell

JACKSONVILLE MINE, open pit, rutile, ilmenite, Zr, South Jacksonville
Prod: 50,000 tons per yr

SEA BOARD PHOSPHATE CO
Dunnellon
PHOSPHATE MINE

SOIL BUILDERS, INC
Dunnellon
MINCOLL MINE, phosphate

SUN PHOSPHATE CO, THE
Dunnellon
(Composed of Globe Phosphate Co, Knight & Bevis, & Seaboard Phosphate Co)

SUPERIOR PHOSPHATE CO
Box 478, Dunnellon
PHOSPHATE MINE

SWIFT & CO
Union Stock Yards, Chicago, Ill
BARTOW PHOSPHATE MINE, Bartow, open pit, phosphate
Gen Mgr: Howard P Gould
Gen Supt: O D Bowers
Mech Eng: W B Hunt
Elec Eng: H K Young
Mine Supt: J B Grant
Asst Mine Supt: E E McKinney
C W Justice

UNITED CLAY MINES CORP
Hawthorne
MINE NO 4, open pit
Mine Supt: L F Worley
Mine Eng: Glenn A Hodges
MILL, at mine
(See Ga, Md, N J, Tenn, S C)

VICTOR CHEMICAL WORKS
Tarpon Springs, Fla
155 N Wacker Dr, Chicago 6, Ill
ELEMENTAL PHOSPHATE PLANT
(See Ill, Mont)

VIRGINIA - CAROLINA CHEM CORP
Nichols
FLORIDA MNG DEPT, phosphate
Mgr: H L Pascoe
MINES, Clear Springs, Homine
10,000-TON FLOT MILL
(See Tenn, Va)

GEORGIA

ALBEA - YORK MNG CO, INC
Box 364, Cedartown
Pres & Gen Mgr: S B Albea, Sr
VP: Glenn T York, Sr
Sec: Glenn T York, Jr
Asst Gen Mgr & Treas: S B Albea, Jr
Purch Agt: S B Albea, Jr & S B Albea, Sr
CREMONT MINE, open pit, Fe
Gen Supt: Joe Allen Baker, Jr
Mine Eng: S B Albea, Jr
Prod: 200 tons
500-TON HEAV MED MILL, Cremont

AMERICAN CYANAMID CO
West Bldg, Rome
Mgr: A W Montgomery
NEW HOLLAND MINE, Hermitage, open pit, bauxite
HOLLOWAY-EASTERLIN MINE, Andersonville, open pit, bauxite
Geol: R V Shell
MILL, Adairsville
(See Ark, Fla, N Y, Va)

AMERICAN TALC CO
Chatsworth
Pres: M W Glenn
VP: F T Glenn
Sec: J B Parry
SHOP TUNNEL, 2 mi E of Chatsworth, talc, soapstone
Prod: 200 tons
Mine Supt: Garvis Swanson
250-TON MILL, Chatsworth
Mill Supt: James Johnston
Mill Frm: Walt Weaver
(See Ala)

APPALACHIAN MINERALS CO
Box 380, Monticello
VP & Gen Mgr: B C Burgess
MINE, Monticello, feldspar
(Subsid of Pacific Tin Consol Corp)

ARRINGTON MNG CO
Box 115, Cedartown
Own: C B Arrington
MINE, Cedartown, Fe

BARTOW MINES, INC
Cartersville
Own: Geo Shropshire
IRON MINE, Aubrey

BARYTES MNG CO
Box 334, Cartersville
Pres: A W Wood
MINE, Cartersville, barite

CLARK & CONNOR
Canton
MINE, Canton, Fe
Idle

COHUTTA TALC CO, THE
Box 938, Dalton
Pres: L F Starr
VP: L B Farrar
Sec & Treas: S A Farrar
Purch Agt & Gen Mgr: Trammell Starr
PORT MINE, 7 mi E of Chatsworth, undergr, talc & soapstone
MILL, Chatsworth

THE FELDSPAR CORP
Box 335, Spruce Pine, N C
FELDSPAR CORP MINE, Monticello, open pit, gr feldspar
Gen Mgr: Carroll Rogers, Jr
Asst Gen Mgr: P C Coletta
Gen Supt: Ralph Hughes
Met: I L McMurray
Mine Supt: Robt Boone
FELDSPAR MILL, Monticello
Mill Supt: Henry Norman
Flot & dry grinding
Prod: 1,000 tons daily
(Subsid of Pacific Tin Consol Corp)
(See N C, Tenn)

GAMMAGE MINING CO
Cedartown
Pres: E L Gammage
IRON MINE

GENERAL ABRASIVE CO
Niagara Falls, N Y
MINE, Kingston, Bauxite
Idle

GRAVES & ACREE MNG CO
Cedartown
MINE, 3 mi W of Cedartown, Fe
Idle
GRAV MILL

HALE - GEORGIA MINERALS CORP
Box 107, Cartersville
VP & Gen Mgr: Henry Stynkal
MINE, Cartersville, Fe
Under devel
MINE, Cartersville, Mn
Idle

HODGE MINING CO
116 W Cherokee Ave, Cartersville
Own: J W Hodge
Sec: M T Shaw
HODGE MINE, 14 mi W of Cartersville, Fe
Prod: 575 tons
Supt: Clyde Shaw
MINE, Bartow County, surface, Fe

KINGMAN MINES, INC
409 College St, Cedartown
MINE, on Reynolds Mt between Cedartown & Cave Spr
Mgr: J L Scott

LADD LIME PRODUCTS CO
Cartersville
Exec-VP: D B Simms
MINE, Bartow County, Lime
Under devel

LAKE MNG CO, INC
Box 343, Cartersville
MINE, Cartersville, Fe

LIBERTY GOLD MINE
4922 D'air Circle, Atlanta 19, N E
Own & Oper: Leonard Markus
LIBERTY MINE, Sugar Hill, undergr, Au, Ag
Prod: 15 tons
Under devel
30-TON FLOT GRAV MILL, at mine

MINERALS PROCESSING CO
c/o Fiszano Bros, Chester Pike & Angelo Ave, Crumlyne, Pa
MINE, Hogg Property, 6 mi S of LaGrange, Ga, mica, quartz
Mine Supt: Ed Stralia
Idle

MOSTELLER BROS
Cartersville
MINE, Cartersville, Fe

NEW RIVERSIDE OCHRE CO
Box 370, Cartersville
Managing Part: J B Dellinger
Asst Gen Mgr: W B Hawkins, Jr
MINE, River Road, open pit, barite, ochre
Gen Supt: John Cobb
Mech Eng: Ross Woodford
Prod: 100 tons

PACIFIC TIN CONSOL CORP
(See The Feldspar Corp & Appalachian Minerals Co)

PAGA MNG CO
Cartersville
MINE, Cartersville, barite
Supt: A O Franz

POSS, W M
Union Point
MINE, Union Point, feldspar
Idle

POWHATAN MNG CO
6721 Windsor Mill Rd, Baltimore 7, Md
Pres: Fred A Mott
GAY & CORNELIA MINES, Dillard, asbestos
Supt: H M Pitts
Idle
(See Calif)

PRICE MINERALS, INC
3300 SW 27th Ave, Miami, Florida
MINE, LaGrange, Bo, Mica
Under devel

SOUTHEASTERN VERMICULITE CO
Macon
Pres: Theron A Holmes
MINE, Bibb County, vermiculite
Under devel

SOUTHERN TALC CO
Box 278, Chatsworth
Pres: M Woodard Glenn
MINE, Chatsworth, talc

THOMPSON - WEINMAN & CO
Cartersville
Gen Mgr: W N Bradley
BARTOW MINE, Cartersville, Bi

UNITED CLAY MINES CORP
Sandersville
MINE NO 5, open pit
Mine Supt: W J Smith
Asst Supt: Roger M Carlson
MILL, at mine
(See Fla, Md, N J, Tenn, S C)

WOODWARD MINES
Cedartown
SHILOH & GOERGIA MINES, Polk County, Fe
Idle

IDAHO

ADELMONN, A G
622 Idaho St, Boise
BAR PLACER, Au, Ag

ALICE SILVER - LEAD MNG CO
Box 460, Wallace
Pres: O L Jones
Sec-Treas: H F Magnuson

AMAZON MNG CO
Box 372, Coeur d'Alene
Pres: A E Lunden
Sec-Treas: Geo M Servick
MINE, in Mont, Au, Cu, Ag
Idle
(See Mont)

AMERICAN SILVER MNG CO
123 W 4th Ave, Spokane, Wash
MINE, 1 mi S of Osburn, undergr, Cu, Au
Under devel by Polaris Mng Co
(See Wash)

AMERICAN SMELTING & REFINING CO, N W MNG DEPT
Box 440, Wallace
Mgr: J C Kieffer
Asst Mgr: S E Zolenkov
Supt of Mines: W J Coombe
Supt of Mills: G A Deshler
Elec Supt: A W Beck
Mech Supt: S W Ward
Purch Agt: P L White
PAGE MINE, Pb, Zn, Ag
Supt: T M Tower
Asst Supt: C J Ward
Frm: Al Young
MORNING MINE, Pb, Zn, Ag
Mine Supt: H H Snook
Prod: 200 tons
1,200-TON MILL, concentrator
FRISCO MINE, Pb, Zn, Ag
Supt: G B Christian
Prod: 250 tons
JACK WAITE MINE, Dudie, undergr, Pb, Zn, Ag
Supt: C H Blackwell
Frm: H F Legault
(Operated under agreement with Jack Waite Mining Co)

GALENA UNIT, 3 mi W of Wallace, undergr, Ag, Pb
Supt: Norman Vinson
Frm: Wilbur Olson
Under devel
(See Vulcan & Callahan Zinc-Lead)
(See Ariz, Calif, Colo, Ill, Kans, Md, Mont, Neb, N J, N Mex, N Y, Tex, Utah, Wash & Federal Mng & Smelting Co, Mo)

ANDERSON, V E
Star Rt, Sandpoint
PEAK LODE, Au, Ag, Cu, Pb, Zn

ANDERSON DEVEL CORP
Gamlet
BULL DOG MINE, Ag, Cu, Pb

ANACONDA CO, THE
25 Broadway, New York 4, N Y
Conda, Idaho
Pres: Clyde E Weed
Exec VP: E S McGlone
Sec & Treas: C Earle Moran
VP, Chg West Oper: C H Steele
Gen Mgr, West Mng Oper: A C Digley, Butte, Mont
Gen Supt of Mines: A R Simms, Butte, Mont
Ch Mech Eng: R J Kennard, Butte, Mont
PHOSPHATE MINE, Conda, open pit, phosphate rock
Mine Supt: L E Traeger
Mine Frm: W J Dezell
800-TON CRUSHING, WASHING & DRYING PLANT, Conda
Mill Frm: Charles Giles
Assayer: A T Peterson
(See Calif, Mont, Nev, N Mex, N Y, Utah)

AUSTIN - MEYER CORP
642 Payton Bldg, Spokane 1, Wash
WEBER MINE, Lakeview dist, Bonner County, Au, Ag, Pb

AUXER GOLD MINES, THE
Sand Point
Pres: Leland C Johnson
VP & Gen Mgr: James Campbell
Sec: A R Nelson
AUXER MINE, 7 mi NE of Hope, undergr, Au, Ag
Under devel
BOSTON GROUP, Bonner County
Pend d'Oreille dist, Au, Ag
Idle

BAD BEAR MINE
Idaho City
Part: E L Breen & Frank G Clement
MINE, Bear Run Road, undergr, Au, Ag
Prod: 15 tons
15-TON GRAV MILL, at mine

BANNER - IDAHO MINES, INC
Scott Bldg, Wallace
Pres: John Davis
VP: C W Bentley
Sec-Treas: J W Coumerilh
Asst Sec: H F Magnuson

BAUMHOFF - MARSHALL CO
Big Creek, Cascade Valley
Pres: Fred Baumhoff
Dr Master: Jack Fischer
6-CUBIC-FOOT DREDGE, Big Creek, Cascade Valley, monazite
Idle
MAGNETIC SEP PLANT, Boise
monazite, Zr, Il, garnet
Supt: Albert H Whiteen
Account: Gran Eyman

BAYHORSE MINE, INC
Challis
Pres: O J Salisbury
VP & Gen Mgr: W B Seigert
Sec-Treas: O G Langness
BEARDSLEY & RAMSHORN MINE, 15 mi SW of Challis, undergr, Ag, Pb, Cu
Idle
(Leased from Ramshorn Mines Co)
PACIFIC & FOREST ROSE GROUPS, 15 mi SW of Challis, undergr, Pb, Ag, Zn, Cu, Au
Under devel
100-TON GRAV FLOT MILL, Bayhorse
(Leased from Aetna Mng & Invest Co, Utah)

BEHRENS BROS
Elk City
Mgr: W T Behrens
LITTLE MOOSE CREEK PLANT, Elk City dist, Idaho County, Au, Ag
Under devel

BEHRENS, DONALD E
Elk City
GOLD POINT MINE, Idaho County, Au, Ag

BEHRENS, HAROLD E & LOGSDON, A M
Box 1183, Spokane, Wash
BEHRENS PLACER, Hoodoo dist, Latah County, Au, Ag

BELL CROSS URANIUM, INC
c/o Virgil S Cross, Jerome
BELL CROSS MINE, Custer County, U_3O_8
Under devel

BENTON MINE
Burke
Pres & Mgr: George W Zeller
Op: A E Tofte
MINE, Leland dist, Shoshone County, Ag, Pb, Zn
Idle

BEVERLAND, HARVEY
Box 488, Mackay
Pres: Harvey Beverland
CORN HUSKER MINE, Pb, Ag
Prod: 100 tons per month

BIG EIGHT MNG CORP
Box 1948, Boise
Pres, Gen Mgr & Purch Agt: A A Creech
VP & Gen Supt: Bob Grant
Sec: Dale Chamberlin
Treas, Asst Gen Mgr & Asst Sec: Clyde W Creech
Geol & Mine Supt: Dale Creech
BIG EIGHT MINE, Dixie, 35 mi SE of Mt Home, open pit, placer, Ag, Pb, Au
Under devel

BIG FOUR MINE
Riggins
Oprs: Scott & Howard Williams
MINE, Florence & French Creek dist, Idaho County, Au, Ag, Cu
Idle

BIG IT MNG & MLG CO
7543 Jones Ave NW, Seattle 7, Wash
Pres: Mrs Fay Kinney
BIG IT MINE, Pine Creek, Smeltersville, scheelite
Under devel
(Under lease to Etherton & Schmiltroth)

BIG SALMON URANIUM INC
851 Main St, Lewiston
Pres: Philip W Jungert
VP: Clyde E Jungert
Sec: James S Aram
MINE, Riggins, undergr, open pit, placer, U_3O_8, Cb, Th, Au, D
Supt: Philip W Jungert
Idle

BITTERROOT URANIUM, INC
Salmon
Pres: I J Wilhite
VP: John Gunness
Sec: Arthur V Seay, Jr
Treas: Carl A Person
SURPRISE MINE, Gibbonsville, undergr, surface
Gen Mgr: Merl A Wilhite
Geol: George E Summers, Jr
Under devel
500-TON SCREENING MILL
Under const

BLACK BEAR MINES CO
Wallace
Pres: W H Hanson
BLACK BEAR GROUP, near Gem, 3 mi S of Wallace, Pb, Zn, Ag
(Leased to Black Bear Silver-Lead Mines)
Under devel

BLACK BEAR SILVER -LEAD MINES, INC
Box 847, Wallace
Pres: Walter Ringel
BLACK BEAR GROUP, near Gem, Shoshone County, Ag, Pb, Zn, Cu
(Leased from Black Bear Mines Co & being developed by Metropolitan Mines Corp)
METROPOLITAN GROUP, Shoshone County, Ag, Pb, Cu
Under devel
(Leased to the Metropolitan Mines Corp)

BLACK BULL MINE
Own: Ralph Baumgardner, Boise
E G Peron, Sanger, Calif
MINE, 30 mi E of Salmon, open pit, Th, U_3O_8
Under devel
(Under lease to Lewis Food Co, 617 E 15th St, Los Angeles 21, Calif)

BRADLEY & ECKSTROM, INC
24 California St, San Francisco 11, Calif
MINES, variety of minerals
(See Ariz, Calif, Nev, Oreg, Utah)

BRADLEY MINING CO
Bradley Field, Boise
Exec VP: John D Bradley
YELLOW PINE MINE, Stibnite
undergr & open pit, WO_3, Sb, Au, Ag
Gen Mgr: Arnold Souders
Met: R J McRae
Mine Supt: Edwin Adams
Equip Supt: G R Hansen
Ch Acct: Jack Smilchger
Under devel
3,400-TON FLOT MILL
YELLOW PINE SMELTER, Stibnite
Supt: Leon Barr
Chem: Frank Jackson
IMA MINE, Patterson, undergr, WO_3, Ag, Cu, Pb
Gen Mgr: C C Hathhorn
Geol: Edward J Hammer
Mine Supt: Clark C Collins
Mech Supt: J A Miller
Chief Clerk: F P Pues
185-TON GRAV-FLOT MILL, Patterson
Mill Supt: Bill Osborn
(See Calif, Nev)

BROUGH, FRED J
Salmon
POPE-EITHEIM MINE, Cu
Idle

BROWN BEAR MINES INC
Farmin Bldg, Sandpoint
Pres: Russell Oliver
VP: George Hines
Sec-Treas: A R Nelson
MINE, 7 mi from Sagel
Under devel

BUCKSKIN MINES, INC
4123 W Holden St, Seattle 6, Wash
BUCKSKIN MINE, Clayton, undergr,
Gen Mgr: J M Jensen
Under devel
(See Wash)

BUNKER HILL CO, THE
The Bunker Hill Bldg, 640 Market St, San Francisco 4, Calif
Chmn of Bd: Stanly A Easton
Pres: John D Bradley
VP: Emmett G Solomon, W G Woolf, D L Feathers, R H Cutting, H E Lee
Sec: D L Feathers
Treas: Emmett G Solomon
Purch Agt: Gil Mayes
Mgr, Mines: S W McDougall
Ch Geol: R H McConnel
Mgr, Plant Ser: L M Griffith
Mgr, Employee & Pub Rel: C E Schwab
Plant Eng: V M Vang
Ch Eng: Arthur Boyer
Elec Maint Supt: Gordon McCulloch
Mech Maint Supt: C H Neubauer
Struct Supt: Fred Prindle
BUNKER HILL & CRESCENT MINES, Box 29, Kellogg, undergr, Pg, Ag, Zn
VP, Kellogg Oper: W G Woolf
Supt: Joe Gordon
Asst Supt: E B Olds
Ch Mine Assayer: Irving Leakey
Mine Frm: Paul Sloan, Don Wilson, George Mast, William Coker
Prod: 1,500 tons
3,000-TON FLOT CONCENTRATOR, Kellogg
Mill Supt: Norman J Sather
Asst Mill Supt: J Gordon Craig
Mill Frm: Ray Roland
LEAD SMELTER, Kellogg
Supt: George Dunn
Asst Supt: Charles Hansen
Ch Research Met: Donald Ingvoldstad
Ch Chem: L W Burgess
Prod: 100,000 tons
ELECTROLYTIC ZINC PLANT, Kellogg
Supt: A Y Bethune
Asst Supt: Walt Schmittroth
Ch Research Met: Gregory Papoff
Ch Research Chem: Leo Baumeister
Prod: 50,000 tons
STAR MINE, Burke (Operated by contract by Hecla Mng Co)
(See Wash)

CALERA MINING CO
BLACKBIRD DIV
Cobalt
BLACKBIRD MINE, Cobalt, undergr, cobalt, Cu
Prod: 1,000 tons
Mgr: E B Douglas
Geol: W C Cole, W T Barnes
Mech Eng: J P Smith
Mine Supt: Gavin Young
Mine Frm: W O'Neal
Mine Eng: C J Whitley
1,000-TON FLOT MILL
Mill Supt: C O Hower
Mill Frm: John Vecchios
Assayer: Rex Toolson
(Subsid of Howe Sound Co)
(See N Y, Utah)

CAMAS URANIUM MNG & DEVEL CO
Gooding
Op: Donald F Vaught
Treas: Lowell Fields
20 CLAIMS, Little Smoky district, Camas County, undergr, Au, Ag, Pb, U_3O_8
Under devel

CAMPBELL, WALTER S
Box 185, Lapwai
LUCKY WIN MINE, S fork of Clearwater Riv, Idaho County, undergr, U_3O_8
Under devel

CAPITOL SILVER LEAD MNG CO
Gearon Bldg, Wallace
Pres: H C Mowery
VP: Joe Swan
Sec-Treas: W A Callaway
MINE, Ag, Pb
Idle

CASTLE, GEORGE
Box 47, Ketchum
EDRIES MINE, Blaine, Au, Ag, Pb, Zn, Cu

CHALLIS VIEW MINE
Challis
Own: Henry & Ella G Smith
Lessees: Heinecke Bros et al, Midvale, Utah
MINE, 8 mi W of Challis, Daugherty Gulch, Ag, Pb
Idle

CHAMPION MINE
Box 281, Mackay
Pres: J L Austich
MINE, 8 mi S of Mackay, undergr, Pb, Cu, Ag
Prod: 15 tons crude

CIRC TWINS MNG CORP
Orogrande
Pres: Ross R Brattain, 4611 E Mercer Way, Mercer Island, Wash
VP: Ottilie H Brattain
Sec-Treas: Mari Brattain
PETSITE MINE, open pit, Au, Cu, WO_3
Gen Supt: Sam Alm
Under devel
PENMAN GROUP, undergr, Au
Idle
CLAIMS, undergr, Au

CLARKE, EDWARD B
Box 151, Clark Fork
LUCKY OPAL & SURPRISE GROUPS, 3 mi NE of Clark Fork, Pb, Zn
Idle
GREEN MONARCH LEASE, Pb, Ag, Zn
Idle

CLAYTON SILVER MINES
Box 890, Wallace
Pres: W M Yeaman
VP: A H Featherstone
Sec: Ray Morrison
CLAYTON SILVER MINES, Clayton, undergr, Pb, Ag, Zn
Gen Mgr: Norman M Smith
Gen Supt: R J Legard
Geol: Don Ferguson
Mine Supt: Dick Settles
Prod: 100 tons
100-TON FLOT MILL

COEUR D'ALENE MINES CORP
203 Gyde-Taylor Bldg, Wallace
Pres: H C Mowery
VP: P E Jacobs
Sec: W A Callaway
MINERAL POINT MINE, Osburn, 1 mi S of Osburn, Ag, Cu
Under devel
(Operated by Polaris Mng Co)
600-TON FLOT MILL

COEUR D'ALENE MNG CO
c/o Eugene F McCann, Box 1207 Wallace
Pres: T M Reynolds
Sec: Carrie M Fuller
PLACER, 15 mi N of Wallace, Au
Gen Mgr: Eugene F McCann
Idle

COEUR D'ALENE SILVER GIANT, INC
Box 838, Kellogg
Pres & Gen Mgr: Harry G Alway
VP: B E Newman
Sec-Treas: Wayne A Brainard
MINE, E Fork of Big Creek, Kellogg, Ag, Pb
Idle
82 LODE CLAIMS, Shoshone County, under working contract

COLSON, FRANK
15th N 10th St, Boise
VACATION #1 & 2 MINES, Summit Flat dist, Boise City, Au, Ag
Idle

COME BACK MNG CO
Idaho City
Acting Pres: Joseph E Gerstick
Gen Mgr & Sec: L F Troger
MINE, 30 mi N of Idaho City, undergr, Au, Ag, Pb, Zn, Cu
Under devel

CONJECTURE MINES, INC
326 Wiggett Bldg, Coeur d'Alene
Pres & Purch Agt: Donald E Major, 421-427 W Third Ave, Spokane, Wash
VP: H E Sanderson
Sec & Treas: Lyle H Pannell
CONJECTURE MINE, Lakeview Lodg via Bayview, 5 mi SE of Lakeview Landing, undergr, Ag, Pb, Zn, Cu, Au, Sb
Gen Mgr: Donald E Major
Asst Gen Mgr & Mine Supt: Walter N Campbell
Mech Eng: Ernie Williams
Met: Frank Eichelberger, Jr
Asst Mine Supt: Ronald Uts
Prod: 80 tons
Under devel
80-TON FLOT MILL, at mine, Ag
Mill Supt: Frank Eichelberger, Jr
(See Wash)

CONTINENTAL MNG CO
Box 460, Wallace
Pres: S K Garrett
Sec-Treas: H F Magnuson
Gen Mgr: C E Small

COPPER BASIN MINE
Mackay
Pres: Claude Heiner
Oper: Clinton A Gunderson
MINE, Alder Creek dist, Custer County, Au, Ag, Cu
Idle

COPPER HILL MNG CORP
116 S Birch St, Jerome
Sec: Louise M Lindsey
Treas: H R O'Harrow
Purch Agt: Emmett A Yadon
MINE, Jerome, Au, Ag, Cu
Idle

COPPER QUEEN MINE
Salmon
Op: E G Peron
MINE, Mackinaw dist, Lemhi County, Au, Ag, Cu
Own: Charlie Kapp & Lester Pratt
Under devel

CORDERO MNG CO
131 University Ave, Palo Alto, Calif
VP: S H Williston
Gen Mgr: J Eldon Gilbert
WILD HORSE MINE, Mackay, 26 mi W of Mackay, undergr, Cu, WO_3
Asst Gen Mgr: V P Haas
Gen Supt: Edward Hager
Under devel
50-TON GRAV MILL, at mine
(See Calif, Nev, Oreg)

CUBA MINING CO
Wallace
Pres: W H Hanson
MINES, 2 mi from Wallace, Ag, Pb
Idle

DAISY KINGS CLAIMS
Garden Valley
Own: E W Bowman
CLAIMS, Deadwood Basin, Ag, Au, Pb, Cu
Idle

DAY MINES, INC
Box 1010, Wallace
Pres & Gen Mgr: Henry L Day
Asst Gen Mgr: Rollin Farmer
Sec: S F Heitfield
Purch Agt: G T Kelton
DAYROCK, MONITOR, TAMARACK, HERCULES MINES, Wallace, undergr, Pb, Ag, Zn
Gen Supt: C E Sparks
Prod: 400 tons
4 FLOT MILLS
Mill Supt: L A Grant
1 Mill Idle

DELMAR MNG & MLG CO
N 5008 Lincoln, Spokane 12, Wash
Pres: Norman E Mills
VP: Adolph Obert
Sec: Harry O Klaus
MINE, Salmon, undergr, Au, Ag
Mine Supt: Irvin Erickson
Under devel
35-TON GRAV MILL, at mine

DEVIL'S TOE DREDGING CO
Shoup
Pres: A P Smothers
Sec: Dave Hansel
MINE, 20 mi W of Shoup, dragline placer, Au, rare earth
Idle

DOUGLAS MNG CO
Box 320, Wallace
Pres: Stanly A Easton
VP: Robert E Sorenson
Sec: L E Hill
DOUGLAS MINE, Pine Creek, 13 mi SW of Kellogg, Pb, Zn, Ag
Idle

DOYLE, JIM
Box 1329, Wallace
AMY MATCHLESS CLEAN-UP MILL
Ag, Cu, Pb, Zn
CONSTITUTION CLEAN-UP MILL, Shoshone County, Au, Ag, Cu, Pb, Zn
DOUGLAS, HIGHLAND, SIDNEY, & SURPRISE CLEAN-UP MILLS, Shoshone County, Ag, Cu, Pb, Zn

DUVALL CO
210 Eccles Bldg, Ogden, Utah
VIRGINIA GROUP, Blackpine dist, Cassia County, Au, Ag
Idle

EAST SILVER BELT LEAD MINES, INC
Box 885, Wallace
Pres & Mgr: R E Sorenson
VP: C H Foreman
Sec: Elof Enbom
MINE, near Mullan
Idle

EBERT, WALTER
Fernwood
PLACER MINE, St Joe dist, Benewah County, Au
Idle

ELDO PLACER MNG ASSN
Pierce
Mgr: A J Roeben
ELDO PLACER CLAIMS, Idaho County, Au, Zr, Monazite, Ilmenite, Rutile
Under devel

ELDRIDGE, S S
Birch Creek
WORTHING MINE, Lemhi County, Ag, Pb, Zn, Cu

ELMQUIST, DON
Pearl
MINE, Au, Ag, Cu, Pb

ENDERLIA, ELMER
Mackay
MINE, Ag, Cu, Pb

ESTES GOLD MINES, INC
Box 476, Mackay
Pres: C E Lanning
VP: D E Bell
Sec: Peter Schreer
YANKEE FORK MINE, Sunbeam, undergr, Au, Ag, Cu
Gen Mgr: David E Bell
Prod: 50 tons
60-TON FLOT MILL, at mine
ALTURA MINE, Sunbeam, undergr, Au, Ag
Idle

FAIRFIELD MNG CO, INC
831 E Main St, Stockton, Calif
Pres & Purch Agt: LeRoy A Washburn
VP: Ray Julius
Sec & Treas: F M Lucarzini
ALVA, EL CAMINO & GOAT MT LODES, Quartz
PRINCESTON & ALAMEDA PLACER CLAIMS, S Fork Boise Riv
Gen Mgr & Mine Frm: LeRoy Washburn
Asst Gen Mgr & Mine Supt: Clifton Finley
Met & Mine Eng: Ray Steyer
Under devel

FAIRWAY URANIUM CORP
2320 S Main St, Salt Lake City, Utah
Pres & Gen Mgr: O C Larson
Sec: Kenneth Taylor
HOODOO MINE, Clayton, undergr, Zn, Pb, Ag, Au
Gen Supt: L W Reiter
Geol: George B Guillotte
Prod: 30 tons

FINCH, VERNON B
218 E Trent, Spokane, Wash
CROOKED RIVER MINE, Elk City, Idaho County, Au, Ag

FLORIDA MT JOINT VENTURE
Box 1008, Boise
ONTARIO MINE, Carson dist, Owyhee County, Au, Ag
Idle

FRIESTAD, ARNE
Hailey
WESTLAKE GROUP, Blaine County, Ag, Pb, Zn

GEM MINES, INC
Warren
THE RESCUE MINE, Idaho County, Au, Ag

GOLCONDA LEAD MINES
Box 257, Wallace
Pres & Gen Mgr: A H Featherstone
VP: J A Featherstone
Sec: H P Magnuson
GOLCONDA MINE, 2 1/2 mi E of Wallace, undergr, Pb, Ag, Zn
Frm: Earl Bellamy
Prod: 40 tons
200-TON FLOT MILL, Mullan Rd, Wallace
Mill Supt: C E Bloom
Asst Mill Supt: Richard Holmberg
Assayer: Peter Mack

GOLD COIN MINE
Star Rt 2, Sand Point
Mgr: J Bessemer
MINE, Bonner County, Ag, Pb, Zn
Idle

GOLDEN AGE MNG CO
Salt Lake City, Utah
GOLDEN AGE MINE, Boise County, Au, Ag, Pb
Idle

GOLDEN NUGGETT MINES & MLG INC
Fairfield
Pres & Gen Mgr: Harry T Furrow
VP: V M Goodwin
Sec-Treas: Mildred Robinson
GOLDEN NUGGETT MINE, Little Smoky & Carrietown dist, Camas County, undergr, surface, Au, Ag, Pb
Under devel

GOLDSTONE MNG CO
511 Securities Bldg, Seattle, Wash
Pres & Gen Mgr: B W Porter
VP: Lynn Gunning
Sec: Emil Mottman
Gen Supt: Walter E Deighton
Geol: Arthur Lakes
Purch Agt: F L Mills
GOLDSTONE MINE, Salmon, 21 mi SE of Salmon, undergr, Au, Cu, Pb
Mine Supt: Walter Deighton
Mine Eng: Arthur Lakes
Under devel
150-TON FLOT MILL

GRANADA LEAD MINES, INC
Box 297, Wallace
Pres: E G Graedinger
VP: R L Roundy
GRANADA MINE, 2 1/2 mi E of Wallace, Pb, Ag, Zn
Under devel

GRAND VIEW MINE
Box K-83, Salmon
MINE, 11 mi S of Salmon, undergr, Au, Ag, Cu
Idle

GUNDERSON, CLINTON A
Mackay
POPE-SHENON DUMP MINE, Eureka dist, Lemhi County, Cu, Ag, Au

HAIFNER, DON
Clark Fork
LAWRENCE MINE, Ag, Cu, Pb, Zn

HAILEY TRUST CO
Hailey
MINE, on Camp Creek, U_3O_8
Under devel

HANSY COPPER & GOLD MINES
Box 588, Wallace
Pres: Osa Belsby
VP: Osborne Belsby
Gen Mgr & Purch Agt: Sam Peterson
Sec: Ruby Brown
HANSY MINE, 3 mi SE of Adair, undergr, Cu, Au, Ag
Under devel

HAROLSON, H L
Shoup
GOLDEN EAGLE PLACER MINE, Mineral Hill dist, Lemhi County, Au, Ag

HARRY ANN MINE
Mackay
Op: Francis Fern
MINE, Alder Creek dist, Custer County, Ag, Pb, Zn
Idle

HAYDEN HILL CONS MNG CO
Box 178, 909 W Sprague Ave, Spokane, Wash
Pres: W G Stratton
VP: J B Phillips
Sec: C C Anderson
Gen Mgr: R R Weideman
PURIM GROUP, Silver Belt, Coeur d'Alene
(Leased to Silver Dollar Mng)

HEATH, TED D
Box 117, Fairfield
AUDRY GROUP & BETTY, Soldier dist, Camas County, Ag, Au
Under devel
MOUNTAIN VIEW GROUP, Skeleton Creek dist, Elmore County, Au, Ag
Under devel

HECLA MNG CO
Box 320, Wallace
Pres: L J Randall
VP: J L McCarthy & R E Sorenson
Sec-Treas: John R Matthews
Purch Agt: R G Hull
STAR MINE, Burke, undergr, Zn, Pb, Ag
Mgr, Mines: William H Love
Mine Supt: Lee Messerly
Ch Geol: H E Harper
Mech Eng: Harry Graff
Elec Eng: N Hubbs
Mine Frm: William Dunphy
Ch Eng: Wallace Crandall
Prod: 800 tons
(owned by The Bunker Hill Co)
800-TON FLOT MILL, Burke, Zn, Pb
Mill Supt: James Hunter
Mill Frm: Robert Miller
Assayer: Thomas Hydorn
(See Utah)

HEINE MINES, INC
Meridian, Boise, Bellevue
Own: A L Heine, Boise
BELLEVUE GOLD GALENA, Bellevue, Au, Ag, Cu, Pb, Zn, Mn, V
24-TON BEAM SMELTER
Idle

HEISEN, C H
Mackay
McFADDEN MINE, Custer County, Ag, Pb

HERMADA MNG CO
Twin Springs
Pres & Mgr: Ernest Oberbillig
VP: Jess Hawley, Jr
Sec-Treas: Carol Oberbillig
HERMADA MINE, 20 mi W of Atlanta, surface
TALACHE CUSTOM FLOT MILL, Atlanta
Idle

HESS, GORDON
Box 386, Murray
KLEPINGER FRACTION PLACER, Eagle Dist, Shoshone County, Au, Ag

HIGHLAND - SURPRISE CONSOL MNG CO
Box 689, Gyde-Taylor Bldg, Wallace
Pres: Frank J Luedke
VP: Henry C Smith
Sec-Treas: W A Callaway
HIGHLAND-SURPRISE MINE, Kellogg, 15 mi SW of Kellogg, undergr, Zn, Pb, Ag
Idle
800-TON FLOT MILL
Idle
DEER TRAIL MINE, Stanley, undergr, Zn, Pb, Ag
Under devel (joint venture with Sunset Mng Co)

HILLTOP MINE
122 S 1st St, Pocatello
Mgr: J e Hamilton
MINE, Lemhi County, Au, Ag, Pb, Cu

HINES, MARVIN
Sagle
BROWN BEAR MINE, Pend d'Oreille dist, Bonner County, Ag
Idle

HOLLY MINERALS CORP
Box 448, Boise
HERMES MINE, Stibnite, undergr, Hg
Supt: James C Brassfield
Prod: 20 tons ore

HOPE SILVER LEAD MNG, INC
Box 153, Clark Fork
Pres: Glenn C Tice
VP: Ed Groenig
Sec-Treas: L P Larson
HOPE MINE, undergr, Pb, Ag, Zn
Frm: E T Shields
Eng: Harold Shields
150-TON FLOT MILL

HORNSILVER MNG & MLG CO
Box 1010, Wallace
Pres: W H Hanson
Sec: S F Heifield
MINES, 3 mi S of Wallace, Ag, Pb, Cu
Idle

HOVERSON, RAY
3213 Fairmont St, Boise
BIG FOOT BAR PLACER MINE, Snake Riv dist, Elmore County, Au
Idle

HULL LEASE
Box 709, Wallace
Mgr: H J Hull
Purch Agt: August Voltolini
GEM MINE, Gem, undergr, Zn, Pb, Ag
Mine Supt: Harry Voltolini
Prod: 75 tons
100-TON FLOT MILL
Mill Supt: Fausto Voltolini

HUMPS OF GOLD MINE
Wallace
Own: Lee Earhart & Richard May
MINE, 15 mi E of Orogrande, undergr, Au, Ag
Under devel

HUNGRY HILL MINE
Salmon
MINE, Eldorado dist, Lemhi County, Au, Ag, Cu

HYPOTHEEK MNG & MLG CO
510 Bank St, Wallace
VP: Sig Torkelson
Sec & Gen Mgr: Roy H Kingsbury
OLD HYPOTHEEK & KING OF PINE CREEK MINES, Kingston, Au, Ag, Pb
Idle & Explor
(See Mont, Utah, Wash & King of Pine Creek Mng Co, Idaho)

IDAHO - ALTA METALS CORP
Mackay
EMPIRE MINE, Alder Cr dist, Custer County, Au, Ag, Cu, Pb, Zn

IDAHO - CANADIAN DREDGING COMPANY
Box 2127, Boise
Pres & Gen Mgr: H B Murphy
VP & Supt: Miles M Young
Sec-Treas: George E Murphy
PLACER, bucket-line dredge, monazite, ilmenite, garnet & zircon
Prod: 50 tons concentrate
(See Fairview Placers, Calif)

IDAHO CONSOL MINES, INC
4100 Arcade Bldg, Seattle, Wash
Pres & Purch Agt: Edmund G Wilson
VP & Treas: Fred J Wettrick
Sec: H B Merrick
TWIN PEAKS MINE, Salmon, 18 mi S of Salmon on U S Hwy 93, undergr, Pb, Cu, Ag, Au
Gen Mgr: Edmund G Wilson
Asst Gen Mgr & Mine Supt: H B Merrick
Gen Supt: John A McLean
Geol & Mine Eng: Allen C Merritt
Mine Frm: Frank Arnold
Prod: 125 tons
150-TON FLOT MILL, at mine
Mill Supt: Frank A nold
SMELTER, Salt Lake City, Utah

IDAHO - CONTINENTAL MINE
Bonners Ferry
MINE, Port Hill dist, Boundary County, Ag, Cu, Pb, Zn
Idle

IDAHO CUSTER SILVER - LEAD MINES, INC
Box 459, Wallace
Pres: Alvo V Alvenslebea
VP: O O Miller
Sec & Treas: H F Magnuson
LIVINGSTON MINE, 16 mi S of Clayton, Pb
200-TON MILL

IDAHO GARNET ABRASIVE CO
Fernwood
Own & Oper: Lowell Thompson
Asst Mgr: Everett Thompson
Sec: Hershel Tripp
EMERALD CREEK DIGGINGS, 9 mi S of Fernwood, placer, garnet
Prod: 8,000 tons per yr
100-TON JIG & CRUSHING PLANT, Emerald Cr

IDAHO LAKEVIEW MINES CO
502 Columbia Bldg, Spokane, Wash
Pres & Gen Mgr: J L Drumheller
VP: Kenneth M Howser
Sec-Treas: L R Gordon
Purch Agt & Gen Supt: Earl A McDaniel
LAKEVIEW MINE, Lakeview, undergr, Ag, Pb, Zn
Idle
KEEP COOL MINE, Lakeview, undergr, Pb, Ag, Zn, Au, Cu
Idle
60-TON FLOT MILL
Mill Supt: L A Demers
SMELTER, Kellogg

IDAHO MINING COMPANY
Box 898, Kellogg
Pres: C Aubrey Grissom
VP: L E Beeson

Sec & Gen Mgr: Bruce E Allgaier
WASHINGTON-IDAHO MINE, W fork, Moon Creek, 6 mi NE of Kellogg, undergr, Pb, Zn, Ag, Cu
Idle

IDAHO NEVADA URANIUM CORP
Albion
Pres & Gen Mgr: Otto R Ward
VP: Sarah Ward
Sec: C E Simonsen
(See Nev)

IDAHO THORIUM CO, INC
Mackay
Pres: J H Stocks
VP: Clinton A Gundersen
Sec: Kenneth Deming
MINE, Salmon, undergr & surface
Th, U_3O_8, rare earths
Under devel
MINE, Tinsley, surface
Idle

IDAMONT LEAD-ZINC MINES CO
S 2323 Lincoln St, Spokane, Wash
Pres: R H Russell
VP: B A Smith
Sec: W B Russell
IDAMONT MINE, Leonia, undergr, surface & placer
Idle

INDEPENDENCE MINE
c/o J B Eldridge, Placerville
MINE, Big Cr dist, Valley County, undergr, Ag, Au, WO_3, CaF_2, Sb
Gen Mgr: J B Eldridge
Idle

INDEX-DALEY MINES, INC
21 SW Temple, Salt Lake City, Utah
INDEX-DALEY MINE, Dixie, Elmore County, Au, Ag, Cu, Pb, Zn

INSPIRATION LEAD CO
W 909 Sprague Ave, Spokane 4 Wash
Pres: E H Carlson
VP: C C Anderson
Sec-Treas & Gen Mgr: W T Anderson
Purch Agt & Asst Gen Mgr: R R Weideman
INSPIRATION LEAD MINE, 304 2 St, Wallace, undergr
Gen Supt: R R Weideman
Geol: W H Simons
Mine Supt: Horace Smith
Under devel
(See Utah)

IONE MNG CO
Wallace
IONE MINE, Boise County, Ag, Pb, Idle

IRON MT MNG CO, INC
Box 523, Weiser
Pres & Gen Mgr: Frank Mortimer
Sec: Claudia J Merritt
MORTIMER GROUP, 30 mi N of Weiser, undergr, Pb, Ag, Cu, Zn, Au
Idle

IVANHOE MNG CO, LTD
c/o W P Bean, Mullan
Pres: J W Coumerilh
Sec: W P Bean
MINE, undergr, Pb, Ag, Zn
Idle

J S PLACER
Garden Valley
Op: George Zezi
MINE, Grimes Pass dist, Boise County, Au, Ag
Idle

JACKIE MNG CO
700 Warm Springs Ave, Boise
JACKIE MINE, Boise County, Au
Idle

JACKSON, TOM
Hailey
BARITE LODE, Blaine County, Ag, Cu, Pb

JIREH MNG CO
Box 449, Bonners Ferry
IDAHO CONTINENTAL MINE, Ag, Cu, Pb, Zn

JOHNSON, CLAIR
Orangeville
JOHNSON MINE, Ten mile dist, Idaho City, placer, Au, Ag
BIG CREEK MINE, Idaho County, Au, Ag

JOHNSON, F A
Rt 1, Eagle
BLUE RIDGE MINE, Grimes Pass dist, Boise County, Au, Ag, Cu, Pb
Under devel

JOSUE, A W
Garden Valley
SUNNYSIDE MINE, S Fork Payette Riv, Boise County, placer, Au, Ag

KALLAS, SR, JOSEPH F
Box 1710, Boise
MINE, Ada County, Au, Ag

KANE, CHARLES B
Mackay
BLUE JAY MINE, Cu

KAPP, CHARLES
Salmon
COPPER QUEEN & GOLDEN COPPER MINES, McDevitt dist, Lemhi County, Au, Ag
Under devel

KIMBALL, ELROY
Mackay
KIMBALL MINE, Custer County, Ag, Pb
Idle

KING OF PINE CREEK MNG CO
612 Chronicle Bldg, Spokane, Wash
Pres: C C Anderson
Mgr: W T Anderson
VP: E H Carlson
Sec: L Howe
MINE, Wallace
Idle
(Leased to Hypothesk Mng & Mfg Co)

KITTOCK, JACK
2303 Nez Perce St, Boise
MINE, Valley County, Au, Ag

KUBESH, JAMES E
1622 9th Ave, Sweet Home, Ore
DUTCH MILL, FREE GOLD MINES, Pierce dist, Clearwater County, Au; rare earths, undergr, placer
Gen Mgr: Kenneth White
Under devel
25-TON GRAV MILL, Pierce dist
RETORT FURNACE
(Ore Ore)

KWAJALEIN MINE
Challis
Op: L V Carothers
MINE, Yankee Fork dist, Custer Cox
Idle

LARSON, R W
South Fork Lodge, Golden
SOUTH FORK MINE, 11 mi E of Golden, undergr, Au, Ag
Idle

LATEST OUT MINE
Op: Harry Stout, Gilmire
MINE, Texas dist, Lemhi County, Ag, Cu, Pb
Idle

LAWRENCE CONS MNG CO
Clark Fork
Pres: C I White
Sec: C I White, Jr
LAWRENCE GROUP, Clark Fork, Pb, Ag, Sb, Zn
50-TON CONC
Under devel

LEAD BLOSSOM MNG & MLG CO
422 High St, Wallace
Pres: Jerry Graver
VP: Margaret Denny
LEAD BLOSSOM MINE, Wardner, undergr, Ag, Pb
Idle

LEADVILLE MINE
Leadore
Op: Hayes, Hayes & Zook
MINE, Junction dist, Lemhi County, Ag, Pb
Idle

LEESBURG URANIUM, INC
230 N 2nd Ave, Pocatello
Pres & Purch Agt: J E Tarr, Jr
VP: B N Worrell, Salmon
Sec: Leo Muns
Treas & Purch Agt: Don Hansen
MINE, undergr, open pit, placer, U_3O_8, Pb, Cu, Au, Ag, monazite
Gen Mgr: J E Tarr, Jr
Asst Gen Mgr: Don Hansen
Under devel
MILL, via Salmon, Idaho, Lemhi County

LEONARD BROTHERS
Silver City via Murphy
Gen Mgr: F L Leonard
PAUPER GROUP, 2 mi SE of Silver County, undergr, Au, Ag, Cu
2-TON GRAV-AMAL MILL, at mine
Idle

LEONARD, MRS R H
Silver City via Murphy
DAVIDSON GROUP, 2 mi E of Silver City, undergr, Au, Ag
Idle

EMPIRE GROUP, 2 1/2 mi E of Silver City, undergr, Au, Ag
Idle

LEONE MARIE MINE
Ovid
Operators: Gambling & Skinner
MINE, Bear Lake dist, Bear Lake County, Ag, Pb
Idle

LINDBURG & URESTI
Mackay
MACKINAC & CAMANCHE MINES, Alder Cr dist, Custer County, Ag, Cu, Pb, Zn
Idle

LITTLE QUEEN MINES, INC
Box 196, Atlanta
Pres: H D Hollenbeck
Sec-Mgr: H M Greenwald
LITTLE QUEEN MINE, Middle Boise dist, Elmore County, Au, Ag, Pb, Zn, WO_3

LOOKOUT MT MNG & MLG CO
Box 838, Kellogg
Pres: Wendell R Brainard
VP: Harry G Alway
Sec-Treas: B J Holm
Under devel

LOUDERBOUGH, DON
Roberts
VALLEY VIEW MINE, Clark County, Ag, Cu

LUCKY CUSTER MNG CORP
Boise
GENERAL CUSTER MINE, Custer County, Au, Ag
Idle

LUCKY FRIDAY SILVER-LEAD MINES CO
Box 1131, Wallace
Pres: Chas E Horning
VP & Gen Mgr: John A Featherstone
Sec-Treas: W J Emacio
LUCKY FRIDAY MINE, Mullan, Hunter dist, Pb, Ag, Au, Cu, Zn
Prod: 50 tons
Mine Supt: David Elder

LUCKY SIX MNG CO
Julietta
Pres: Donald Cantril
Sec-Treas: John Longsteig
Gen Supt: Alec McIntosh
Ch Engr: Harold Freeman
455 MINE, 2 mi SW of Clarkia
undergr & placer, Ti, Fe, Au
Idle
41 MINE, Southwick, 6 mi E of Southwick, undergr & placer, Ti, Fe, Au
Idle

MACKAY EXPLOR CO
4212 Franklin Rd, Boise
Pres & Gen Mgr: W P Barton
VP & Sec: D E Bell
Treas: M S Barton
EMPIRE MINE, 3 mi W of Mackay, Cu, Au, Ag, WO_3
Under devel

MARR, FRANK H
611 Peyton Bldg, Spokane, Wash
BUNKER HILL (lessee), Kellogg, undergr, Pb, Ag, Zn
Gen Mgr: C F Redding
Mine Frm: Milton Turley
Prod: 75 tons
150-TON FLOT MILL
Mill Frm: Frank Weigel

MARSHALL, TOM
Clayton
TREON CREEK MINE, Bayhorse dist, Custer County, placer, Au
Idle

MASCOT MINES, INC
Box 989, Kellogg
Pres: Malcolm C Brown
VP & Purch Agt: Dunham Bell
Sec-Treas: H F Magnuson
LITTLE PITTSBURGH MINE, Pine Creek, Kellogg, undergr, Au, Pb, Ag
Idle
150-TON FLOT MILL, Pine Cr
Idle
(See Utah)

MAYFLOWER GOLD MINES, INC
Placerville
Pres & Gen Mgr: J B Eldridge
VP: H H Eberle
Sec & Treas: G R Eldridge
MAYFLOWER MINE, 3 mi NW of Placerville, undergr & placer, Au, Ag, Zn
monazite, rare earths
Idle

MC COY MINE CO
Box 370, Rt 5, Boise
MINE, Box 453, Hailey, 4 mi W & 2 mi S of Hailey, undergr, Au, Ag, Fe
Gen Mgr: Charles H Shepherd
Asst Gen Mgr: W A Shepherd
Under devel
MILL, at mine

McCUNE & WORTHING
Roberts
VALLEY VIEW MINE, Birch Creek dist, Clark County, Ag, Cu
Idle

McGOWN, A W
Box 137, Challis
POCKET PLACER MINE, Yankee Fork dist, Custer County, Au, Ag

McGREGOR MNG CO
Box 45, Cataldo
Pres: M C Jacobson
Sec: Mrs Grace Jacobson
McGREGOR, PACIFIC MINES, Cataldo Gulch, Au, Ag, Cu, Pb, Fe
Idle

McRAE TUNGSTEN CORP
Stibnite
Pres: R J McRae
VP: Robert Martin
Gen Supt: Harry M Sargent
SNOWBIRD & RED BLUFF MINES, Stibnite, 10 mi W of Big Creek, Valley County, undergr, Huebnerite, Scheelite
Prod: 25 tons
Mine Supt: James Collord
24-TON FLOT-GRAV MILL, Big Cr

METALINE & PINE CREEK CONSOL MNG CO
Scott Bldg, Wallace
Pres: Stanley Easton
VP: J B Haffner
Sec: L J Randall
Asst Sec: H F Magnuson

METALLICS UNLIMITED
Box O, East Ely, Nev
VALLEY VIEW MINE, Star Rt Dubois, 35 mi NW of Medicine
undergr, Cu
Idle

METROPOLITAN MINES CORP, LTD
510 Bank St, Wallace
Pres & Mgr: Roy H Kingsbury
Sec-Treas: A J Teske
(See Black Bear Silver-Lead Mines, Inc)

MINERAL RECOVERY & ENGINEERING CO
Box 470, Wallace
Proprietor: Paul H Floyd
WO_3 UPGRADING PLANT (GRAV FLOT), Burke Canyon near Gem
Capacity: 20 units WO_3 daily
Idle

MINES, INC, THE
621 R S, Boise
Pres & Gen Mgr: Ramon S Carlton
VP: Roy Allumbaugh
Sec-Treas: H V Packer
Geol: Robert Charbonneau
B & W #1-3, RITAMAE #1-2-3, 3 mi W of Bellevue, undergr, Pb, Ag, Zn, Au
Under devel

MONSANTO CHEM CO INORGANIC CHEM DIV
Soda Springs
Plant Mgr: R B Rummer
Prod Supt: W P Dunlap
Maint Supt: F F Hendrickson
Plant Buyer: G F Dupin
BALLARD MINE, 17 mi N of Soda Springs, open pit, phosphate rock
Mine Supt: R H Crouse
Asst Mine Supt: J A Reeves
Prod: 4,200 tons
MILL, 2 mi N of Soda Springs, rotary kiln
Mill Supt: R H Crouse
Asst Mill Supt: D L Gillette
ELECTROLYTIC SMELTER, 2 mi N of Soda Springs
Supt: F C Thomas
Asst Supt: W N Bingham
(See Mo, Tenn)

MONTANA COAL & IRON CO
Weshoe, Mont
BLACK PINE MINE, Blackbird dist, Lemhi County, Ag, Cu
Under devel

MOUNTAIN KING MINE
Box 32, Hailey
Mgrs: Fred & Earl Shirts
MINE, Seafoam dist, Custer County, Au, Ag, Cu, Pb, Zn

MULLAN SILVER - LEAD CO
Scott Bldg, Wallace
Pres: J E McKay
VP: James Doyle, Jr
Sec-Treas: H P Magnuson

NABOB SILVER - LEAD CO
Box 669, Kellogg
Pres: H J Hull
VP, Gen Mgr & Purch Agt: C C Dunkle
Sec-Treas: Jane H Olsen
MINE, Pine Cr, undergr, Zn, Pb
350-TON FLOT MILL
Mill Supt: E M George

NATIONAL MINES, INC
Box 277, Malad
Pres: W L Baker
VP & Gen Mgr: C A Dye
Sec: Blythe G Clemens
SENTINEL MINE, 20 mi NE of Howe, Zn, Pb, Ag
Idle

NEWCOMB, ROBERT
2115 N 34th, St, Boise
OLE PLACER, Idaho County, Au, Ag
Idle

NEW HILARITY MNG CO
Box 37, Spokane, Wash
Pres: E W Neyman
VP: W Brainard
Sec-Treas: E K Barnes
Asst Sec-Treas: E M Borjesson
MINE, Box 643, Wallace
Foreman: Eugene C Iverson
Idle

NEW HOPE MINE
Ketchum
Op: Eugene Nenon
MINE, Warm Spr dist, Blaine County, Ag, Pb
Idle

NEW RAINBOW MNG CO
647 Peyton Bldg, Spokane, Wash
Pres & Treas: Robert B Austin
VP: Orland A Scott
Sec: Marjorie M Tawney
WEBER MINE, Bayview Landing, Lakeview, Bonner County, undergr, Au, Ag, Pb
Idle

NICHOLIA MINE
Gilmore
Owner & Oper: Joe Zock
NICHOLIA MINE, Spring Mt dist, Lemhi County, undergr, Ag, Pb
Idle

NIXON, WM A ESTATE
Rocky Bar
Op: Oscar Pearson
EMPIRE GROUPS, Elmore County
Idle

NOREN, H O & JAMES, JOSEPH J
Oregrande
HEMATITE MINE, Oregrande dist, Idaho County, Au, Ag
Idle

NORTH FORK MNG CO
Box 460, Wallace
VP: Vernon J Robinson
Sec: Earl Chilcott
MINE, 18 mi N of Wallace

NORTHWEST MINERALS INC
730 Peyton Bldg, Spokane 1, Wash
HUNTER-CONTINENTAL MINE, Pinehurst, undergr, Pb, Ag
Gen Mgr: H E Besly
Geol: H Gratton Lynch
Idle
(See Wash)

NORTHWEST URANIUM MINES INC
Box 1088, Wallace
Pres: F E Scott
VP & Gen Mgr: Clark L Wilson
Sec: Alden Hull
Treas: Jack D Gay
(See Wash)

OXFORD COPPER MNG CO, LTD
321 First St, Orofino
Pres: A B Curtis
VP, Purch Agt, & Gen Mgr: Robert Ood
Sec & Treas: Carrol Broch
MINE, undergr, Cu
Under devel
MILL, near Pierce

PAINTER, MILES L
Box 43, Dixie
ESPERANZA MINE, Oregrande dist, Idaho County, placer, Au, Ag
Idle

PAYMASTER, INC
611 Peyton Bldg, Spokane 1, Wash
Pres: Frank N Marr
Sec: C D Randall
MINE, 31 mi SW of Arco, undergr,
Idle

PENMAN MINE CLAIMS
c/o Ross R Brittain, 7500 NE 32nd Way, Mercer Island, Wash
CLAIMS, Oregrande 4 mi SE of Oregrande on Dixie Road, undergr, Au
Idle

PHOENIX MINES
Mackay
Partners: Harvey Beverland, J L Austick
MINES, Mackay, undergr, WO_3
Idle

PLAINVIEW MNG CO
602 2nd St, Kellogg
Pres & Gen Mgr: S K Garrett
Sec: Charles W Simons
MINE, Osburn
Idle

POLARIS MNG CO
Box 320 Wallace
Pres: L J Randall
VP: George Zeller
Sec-Treas: J R Matthews
Purch Agt: R G Hull
SILVER SUMMIT MINE, 7 mi W of Wallace, undergr, Ag, Cu, Pb
Mgr of Mines: William H Love
Mine Supt: George Grismer
Mine Frm: A P McDonald
Prod: 200 tons
300-TON FLOT MILL, Polaris
Mill Supt: J N Hunter
Mill Frm: Wm Bohn
(See American Silver Mng Co, Coeur d'Alene Mines Corp, Rainbow Mng & Mlg Co, Ltd)

PORTER BROS CORP
Box 667, 2560 Warm Springs Ave, Boise
Pres: R F Porter
VP & Sec-Treas: D L Skidmore
Purch Agt: D L Ranft
BEAR VALLEY PLACER, at Bear Valley, Valley County, placer, columbium, tantalum, uranium, monazite, rare earths
300-TON GRAV MILL, Lowman
Mill Supt: A L Rose

PRAULS, FRANK
Box 6, Teadore
BROWN BEAR MINE, Lemhi County, A, Cu, Pb, Zn

PREMIER STAR MNG CO
Box 132, Osburn
Pres: J A Moore
LUCRETIA CLAIMS, Hunter dist, Shoshone County
Idle

PRINCETON MNG CO
Scott Bldg, Wallace
Pres: H J Hull
VP: J V Grismer
Sec-Treas: H P Magnuson
MINE, E of Mullan

PROFILE TAMARACK MINES
c/o E P Shoemarp, 300 SW 4th Ave, Portland, Oreg
CENTRAL GALENA GROUP, Yellow Pine, 70 mi NE of Cascade, undergr, Ag, Pb, Zn, Au
Under devel
(See Oreg)

PUMICE, INC
Box 517, Idaho Falls
Pres: Warren Briggs
VP: C G Wyllie
Sec-Treas: W R Hoops
Plant & Mine Supt: C E Weaver
MINE, 9 mi E of Ammon, surface, pumice
Geol: V E Carmessi
Prod: 400
MILL, Ammon

RADIORE MNG & EXPLOR CO
Box 66, Milton-Freewater, Oreg
Pres: Earl C Murray
VP: James G Howtum
Sec: Henry Kaye
MINE, Mineral Hill Mng dist, Blaine County
Under devel

RAINBOW MNG & MLG CO LTD
Box 880, Wallace
Pres: H C Mowrey
Sec-Treas: W A Callaway
RAINBOW #1 GROUP, Evolution dist, Cu, Ag, Pb, Zn
Under devel by Polaris Mng Co

RAMSHORN MINES CO
333 F It Bldg, Salt Lake City, Utah
Pres: W W Murray
Sec: Leo Eagar
RAMSHORN & BEARDSLEY MINE, Bayhorse, 70 mi NW of Mackay, Ag, Pb, Cu
Idle
(Leased to Bayhorse Mines, Inc)

RARE METALS CORP OF AMERICA, NORTHWEST DIV
1st Security Bldg, Salt Lake City 11 Utah
IDAHO-ALMADEN MINE, Box 627, Weiser, Washington County, open pit, Hg
Mine Supt: J J Snider
Assayer: Jerry Sugden
Prod: 175 tons
175-TON ROTARY KILN MILL, Weiser
Mill Supt: J J Snider
Asst Mill Supt: Harry Clemens
(See Ariz, Calif, Utah)

RARE METAL MINES, INC
E 601 Crown Ave, Spokane, Wash
Pres: Arthur I. Hooper
MINE, Bonner County, Au, Ag
Idle

RED BIRD MINE
Clayton
Partners: Buchman, Brochus & Harden
Gen Mgr: J A Nordon
MINE, 9 mi NW of Clayton, undergr, Pb, Ag

RED LEAF GROUP
Hailey
Opers: E W Sowers, Stanley Johnson
MINE, Mineral Hill & Camas Dist, Blaine County, Ag, Pb
Idle

RELYEA, GEORGE A
Pierce
RED CLOUD MINES 1-10, 9 mi, E of Pierce on Orofino Creek, undergr, Au, Ag
Mine Supt: George A Relyea
Mine Frm: John Pauser
Idle
(See Mont)

RICHARDSON PLACERS
Box 756 Salmon
Gen Mgr: G E Shoup
Asst Gen Mgr: R M Shoup
PLACERS, 30 mi W of Salmon, Au, Ag

RIPPEN, JOHN
Box 131, Atlanta
HAZEL QUEEN MINE, Logan County, Au, Ag

RIVER QUEEN MINE
c/o Tom Peck, Carey
MINE, Seven Devils dist, Adams County, Ag, Cu
Idle

ROBERTSON & STEEPLES
Mackay
GRANDVIEW MINE, Au, Ag, Cu

ROSEBUD MINES, INC
Box 887, Salmon
HILLTOP MINE, Texas dist, Lemhi County, Au, Ag, Cu, Pb
Idle

RUDOLPH & HAYES
Golden
BOB MINE, 10 mi dist, Idaho County, Au, Ag
Idle

RUSTLER MNG CO
830 E 3rd St, Casper, Wyo
RUSTLER MINE, 10 mi SW of Hailey, undergr, Ga, Ag, Zn, U_3O_8

Gen Mgr: Wm T Deacon III
Geol: J H Bright
Under devel
(See Wyo)

ST PAUL LEAD CO
c/o James G Fowlis, Sidney Bldg, Kellogg
SNOWSHOE & ST PAUL MINES, Ag, Pb, Zn

SALMON RIVER SCHEELITE CORP
Clayton
Pres: Harvey Penney
VP: Larry F Runnenkamp
Sec-Treas & Gen Mgr: James E Clotts
Asst Gen Mgr: D P Lemons
TUNGSTEN JIM MINE, Clayton, Thompson Cr, undergr, WO_3
Mine Supt: George Wilson
Prod: 40 tons
40-TON GRAV MILL, at mine

SALMON URANIUM & THORIUM CO, INC
Mackay
Pres: Clinton A Gunderson
VP: J H Stocks
Sec-Treas: Kenneth H Deming
MINE, Salmon, undergr, surface, Th, U_3O_8, rare earths
Under devel

SAN FRANCISCO CHEMICAL CO
Montpelier
Pres: D L King
VP: Max L Spealman & W Jerome Taylor
Sec-Treas & Purch Agt: Rex L Jones
WATERLOO MINE, E of Montpelier, open pit, phosphate
Gen Supt: Charles C Stephens
Mine Supt: Loraine F Jacobsen
(See Utah, Wyo)

SAWLOG MNG
Sharp
Gen Mgr: Magnus Bevan
Sec: Hazel Bevan
TWILIGHT MINE, undergr & surface
Under devel
5-TON GRAV MILL, at mine

SCHULTZ, HARRY A
Idaho City Stage, Boise
RAINBOW GROUP, placer, Au
Idle

SEATON, E T
Box 151, Atlanta
GOLDEN STRINGER MINE, middle Boise dist, Elmore County, Au, Ag
Idle

SHAMROCK #1 MINE
Golden
Op: H W White
MINE, 10 mi dist, Idaho County
Idle

SHAWLEY, C F & ANDERSON, V E
Elk City
GOLDEN EAGLE MINE, Dixie dist, Idaho County, undergr, Au, Ag
Under devel

SHERWOOD, RAY
Hailey
MINE, Valley County, placer, Au, Ag

SHUCK, J J
Elk City
SHUCK'S PLACER, Elk City dist, Idaho County, Au

SIDNEY MNG CO
102 Sidney Bldg, Kellogg
Pres: M C Brown
Sec-Treas: F E Marler
Gen Supt: C A McKinley
Mech Eng: Zane Smith
Purch Agt: A G Filippo
SIDNEY MINE, 15 mi S of Kellogg, undergr, Zn, Ag, Pb
Prod: 100 tons
300-TON FLOT MILL, Pine Cr dist
Supt: C A McKinley

SIERRA SILVER - LEAD MINES CO
714 W Sherman, Spokane, Wash
HARDSCRABBLE GROUP, Osburn, Shoshone County, Ag, Pb, Cu
Under devel
SISTER, SHOSHONE, & TRAPPER GROUPS, Osburn, Shoshone County, Ag, Pb, Zn
Under devel

SIGNAL MNG CO
410 Main St, Kellogg
Pres: H G Alway
VP: John B Penney
Sec: Wendell H Brainard
Gen Supt: Eugene C Iverson
HILARITY GROUP, 7 mi W of Kellogg, undergr, Zn, Pb, Ag
Mine Supt: Eugene C Iverson
Undrr devel

SILVER BUCKLE MNG CO
Box 1088, Wallace
Pres: Dr F E Scott
VP & Gen Mgr: Clark L Wilson
Sec: Alden Hull
Treas: Jack D Gay
SILVER BUCKLE-VINDICATOR PROJECT, Wallace & Mullan, Pb, Ag
Under devel
(See Utah)

SILVER DOLLAR MNG CO
909 W Sprague Ave, P O Box 122, Spokane 10, Wash
SILVER DOLLAR MINE, Osburn,

undergr, Pb, Ag
Geol: P E Oscarson
(See Wash & Hayden Hill Cons Mng Co, Idaho)

SILVER PIRATE MNG CO
Box 298, Kellogg
Pres: Donald J Diehl
VP, Purch Agt & Gen Mgr: Albert M Nash
SILVER PIRATE MINE, Kellogg
Under devel

SILVER ROCK MINE
c/o Joe Burkhart, Eagle via Peart
MINE, West View dist, Gem County, Au, Ag
Idle

SILVER STAR MINES
310 Bank St, Wallace
Pres: M D Anderson
Sec: V C Kingsbury
SILVER STAR MINE
Idle
(See Utah)

SILVER STAR-QUEENS MINES, INC
Box 158, Hailey
Pres: Garfield Vogel
VP: Edward B Riley
Sec-Treas: J McFadden
Purch Agt: M F Sabala
OLD MINNIE MOORE & QUEEN OF THE HILLS MINES, 1 mi W of Bellevue, undergr, Pb, Ag, Zn
Gen Mgr & Supt: Roy T Fite
Under devel
(See Walker Eng Corp)

SILVER STILL MNG CO
Weiser
Pres: Lee Thorson
VP: Kenneth Steck
Sec: E W Horner
SILVER STILL MINE, Mineral, 30 mi N of Weiser, Ag, Cu, Pb, Zn
Idle

SILVER SYNDICATE, INC
Box 1170, Wallace
Pres & Gen Mgr: W M Yeaman
VP: Ray Morrison
Sec-Treas: A H Featherstone
SILVER SYNDICATE MINE, 10 mi from Wallace, undergr, Au, Cu, Pb, Zn, Ag
Operated by Sunshine Mng Co

J R SIMPLOT CO
Continental Bank Bldg, Boise
Pres: J R Simplot
VP: W Grant Kilbourne
Treas: John M Dahl
Sec & Atty: Lloyd E Haight
Mgr of Mines: George A McHugh
Staff Geol: Joe Jemmett, S A Robinson, C W Sweetwood
FERTILIZER DIV, Box 912, Pocatello
Gen Mgr: W Grant Kilbourne
GAY MINE, near Fort Hall, open pit, phosphate
Gen Mgr: John Kobe
Mine Supt: Ray Bowden
Mine Eng: Robert Truchot
Mine Frm: Tom Hughes
Prod: 8, 000 tons
FERTILIZER PLANT, Pocatello
Plant Eng: R L Long
Chem Eng: Oscar C Finkelberg
Auditor: William Hahn
FLUORSPAR DIV, Challis
Inactive
(See Mont, Nev, Wyo & Warren Dredging Corp in Idaho)

SKY LINE MINE
c/o Alvin Ellis, Clayton
MINE, Bayhorse dist, Custer County, Au, Pb
Idle

SMITH, JOHN E
Inkom
WORTHING MINE, Lemhi County, Ag, Cu, Pb, Zn

SMITH - MURPHY LEASE
151 - 1/2 King St, Wallace
OROFINO DUMP MINE, Summit dist, Shoshone County, Ag, Pb, Zn
Under devel

SMOTHERS, A P
Shoup
ELKHORN BAR PLACER, 52 mi W of Shoup, dragline placer, Au, rare earths
Idle
BROKEN HALTER MINE, 50 mi W of Shoup, undergr & surface, CaF_2
Idle

SNOOSE MNG CO
Box 67, Hailey
Pres: W F Smith
VP: Mrs A M Jensen
Sec-Treas: R S Dacus
SNOOSE MINE, 4 1/2 mi SE of Hailey, undergr, Za, Pb, Ag
Idle

SOUTH BUTTE MINE
Mackay
Op: Edward Heninger
MINE, Bayhorse dist, Custer County, Ag, Cu, Pb, Zn
Idle

SPIDER URANIUM MNG CO INC
6 Itex Bldg, Pocatello
VP: Wm E Westergard
CLAIMS, Bannock County near Pocatello, Pb, Ag
CLAIMS, in Utah
(See Utah)

SPOKANE-IDAHO MNG CO
611 Peyton Bldg, Spokane 1, Wash
Pres: Frank H Marr
Sec: C D Randall
Treas: Charles E Marr, Jr
CONSTITUTION MINE, 9 1/2 mi SE of Pinehurst, undergr, Zn, Pb
Idle

SQUAW PEAK MINE
McCall
Partners: F B Frasier, S L Frasier, R J Frasier & A B Roger
MINE, 25 mi N of McCall, undergr & surface, Au, Pb, Zn, Ag, Cu, WO_3, U_3O_8
Supt & Mgr: G W Frasier, Weiser
Idle

STRACK, LESTER J
Elk City
CROOKED RIVER MINE, Elk City dist, Idaho County, placer, Au, Ag
Under devel
BLUE MOON MINE, Idaho County, Au, Ag

SUCCESS MNG CO
Wallace
Pres: Henry L Day
SUCCESS MINE, Wallace, Zn, Pb, Ag, Sb
Idle

SULLIVAN MNG CO
Bradley
STAR MINE, Hunter Dist, Shoshone County, Ag, Cu, Pb

SUNGOLD MINES, INC
718 Hutton Bldg, Spokane, Wash
Pres & Mgr: W T Putman
SUNGOLD MINE, Grangeville, undergr, Au
Idle
(See Wash)

SUNSET LEASE
Day Bldg, Wallace
Gen Supt: R Farmin
SUNSET MINE, 10 mi N of Wallace, undergr, Za, Pb

SUNSET MINES, INC
Box 869, Kellogg
Pres: O Bardahl
VP: David Harvey
Sec: C B Merritt
LIBERAL KING MINE, 11 mi W of Kellogg, undergr, Zn, Pb, Ag, Au
Gen Mgr: R E Lomax
125-TON FLOT MILL, at mine

SUNSHINE CONS, INC
102 Sidney Bldg, Kellogg
Pres: W M Yeaman
VP: Ray Morrison
Sec & Treas: F E Marler, Jr
Gen Mgr: N M Smith
SUNSHINE CONS MINE, 6 mi E of Kellogg, undergr, Ag
(Under devel by Sunshine Mng Co)

SUNSHINE MNG CO
738 Peyton Bldg, Spokane 1, Wash
Pres: Robert M Hardy, Jr
VP: C M Hull
Sec-Treas: Frank M Hardy
Asst Sec: Stanton B Bennett
Asst Treas: Vincent B Whelan
Mgr, Mng Div: John Edgar
Mgr, Petroleum Div: A F Wynn
SUNSHINE MINE, Box 1060, Kellogg, undergr, Ag, Pb, Cu, Sb
Mgr: H B Johnson
Geol: James B Colson
Ch Eng: James C Durham
Purch Agt: N J Osborne
Mine Frm: Charles A Angle
Prod: 750 tons
1, 000-TON FLOT MILL
Mill Supt: Wayne D Gould
Asst Mill Supt: Frank H Sharp
Mill Frm: Lyle Cornell
Antimony Plant Frm: Harold Palmer
SILVER SYNDICATE MINE
(See Silver Syn Mng Co)
SUNSHINE CON MINE
(See Sunshine Cons)
(See Utah & Fairview Placers, Calif)

SUN VALLEY LEAD-SILVER MINES, INC
Ketchum
Pres: Arthur Swensen
VP: L O Lindberg
Sec-Treas & Gen Mgr: J R Thornton
MINE, undergr
Supt: Fred Lease
Idle
100-TON FLOT MILL, Ketchum
Supt: George Stokes

SUN VALLEY MNG CORP
136 S Locust St, Jerome
Gen Mgr & VP: John Owen
Gen Supt: E A Yadon
Geol: Joe Shipment
Met: Mark G Smerchanski
Sec-Treas: Louise M Lindsey
MINE, Hailey, Ag, Au, Zn, Pb
undergr
Mine Supt: Emmett Yadon
Mine Eng: Mark G Smerchanski
Idle
15-TON MILL

TALACHE MINES, INC
1111 Grove St, Box 2088, Boise
Pres: A H Burroughs, Jr
VP: B K Burroughs
Sec: W A Giffin
BOISE-ROCHESTER & MONARCH MINES, Atlanta, undergr, Au, Ag
Gen Mgr: A H Burroughs, Jr
400-TON FLOT MILL

TAYLOR, IVAN J
Ketchum
PHI KAPPA LEASE, Blaine County, Au, Ag, Cu, Pb, Zn

TAYLOR & PRITCHETT
Box 537, Mackay
CHAMPION MINE, Alder Cr dist, Custer County, Ag, Cu, Pb
Under devel

TEMPLE MOUNTAIN URANIUM CO
39 Exchange Place, Rm 23, Salt Lake City, Utah
Pres: Herman Heinecke
VP: George Heinecke
Sec: Augustus Reeves
CHALLIS VIEW MINE, Challis, Pb, Ag
Gen Mgr: Herman Heinecke
Asst Gen Mgr: George Heinecke
Geol: B E Grant
Idle
(See Utah)

THORNALL, CLYDE
Harvard
MINE, Latah County, Au

TREASUREMONT MNG CO
1138 10th Ave N, Seattle, Wash
Pres & Gen Mgr: W J Logue
Sec & Treas: M A Logue
QUIGLEY MINE, 6 1/2 mi E of Hailey, undergr, Pb, Ag
Geol: James M McDonald
Mine Supt: Al Linderman
Under devel

TRIUMPH MNG CO
Triumph
Pres: J W Swent
VP: E H Snyder
Sec-Treas: John W Hamilton
Purch Agt: L K Van Sickle
TRIUMPH MINE, Triumph, undergr, Pb, Ag, Zn
Gen Mgr: L M Robinson
Elec Eng: James B Deering
Ch Eng & Acting Mine Supt: J M Barrett
Mine Frm: Rupert T House
Asst Mine Eng: John N Butler, Jr
Prod: 300 tons
300-TON FLOT MILL, Triumph
Mill Supt: A F Crosby
Mill Frm: Emanuel Silva
Assayer: A L Hall

TUMELSON, ROY
426 Lapwai Rd, Lewiston
CLEARWATER MINE, Clearwater Riv dist, placer, Au
Idle

TURTLE MINE
Challis
Owners: Leo D Ivie & Elray N Kimball
MINE, Mackay, 1 mi from Bayhorse, undergr, Ag, Pb, Cu
Idle

TWIN RIVERS, INC
Wiggins
Pres & Gen Mgr: Bill White
Sec-Treas: Max Maynard
GOLDEN RULE MINE, Warren placer, Au, Ag, Monazite
Asst Gen Mgr: Rex Winters
Under devel

UNITED IDAHO MNG CO
808 Newhouse Bldg, Salt Lake City, Utah
Pres & Gen Mgr: Roger V Pierce
UNITED IDAHO MINE, Gilmore, undergr, Pb, Ag
Under devel & explor

URANIUM EXPLORATION CORP OF IDAHO
251 Main Ave E, Twin Falls
Pres: Bert A Sweet, Sr
VP: Bert Sweet, Jr
Sec-Treas: Leonard Mauss
Purch Agt & Mine Supt: Lawrence Severe
PARK CANYON MINE, Twin Falls, 27 mi from Ketchum, undergr, surface, U_3O_8
Under devel

VENDETTA CHIEF MNG CO
Murray
Pres: Maynard H McPhee
VP: Florence Lillie
Sec-Treas: Helen C McPhee
MINE, Murray, Pb, Ag
Gen Mgr: Chas U Burnell
Idle

VINDICATOR SILVER-LEAD MNG CO
Wallace
Pres: W J Logue
VP: Mrs A M Magnuson
Sec-Treas: H F Magnuson
VINDICATOR MINE, 2 mi E of Mullan, undergr, Pb, Ag, Zn
Under devel

WAKEMAN, J Q
1417 N 5th St, Boise
MINE, Elmore County, placer, Au, Ag

WALKER ENGR CORP
612 Dooly Bldg, Salt Lake City 1, Utah
Pres: R T Walker
VP: W J Walker
Sec: Belle T Walker
MINNIE MOORE MINE, Blaine County
undergr
(Under lease to Silver Star-Queens Mines, Inc, Idaho
(See Colo, Utah)

WALL & HEATH
Box 117, Fairfield
CAMAS COUNTY DIATOMITE MINE, open pit, diatomite
Under devel

WAR EAGLE MNG CO, INC
114 E Chestnut St, Yakima, Wash
WAR EAGLE MINE, McCall, undergr, Au, Ag
Gen Mgr: E W Petersen
Idle
75-TON HEAVY MEDIA MILL, McCall
(See Wash)

WARREN DREDGING CORP (J R SIMPLOT CO SUBSD)
Boise
Pres: J R Simplot
VP: L E Haight
Sec-Treas: John M Dahl
(See J R Simplot, Idaho)

WASATCH MNG & DEVEL CO
Preston
MINE, Bear Lake County, Mn
Under devel

WEST STAR MNG CO
1221 Sixth, Coeur d'Alene
Pres: K H Biesser
VP: Chas U Burnell
Sec: Julia M Hughes
Treas: A Burnell
WEST STAR MINE, Box 9, Gem
undergr, Pb, Ag, Zn, Au
Gen Mgr: A Markwell
Under devel

WESTERN CONS MINES, INC
Box 1406, Eastman Bldg, Boise
Pres & Gen Mgr: Gene Jack
VP: John F Miller
Sec & Treas: B M Andrews
Gen Supt: E Albrecht
OPHIR MINE, Rocky Bar, undergr, Au, Ag
Under devel
50-TON FLOT MILL

WHITE BROS LEASE
c/o B W White, S S Star Route, Kellogg
LIBERAL KING MINE, Shoshone County, Au, Ag, Cu, Pb, Zn

WHITEDELPH EXTENSION MNG CO
421 Michigan St, Sandpoint
Pres: E F Abromeit
VP: E N Welo
Sec-Treas: Oscar M Welo
WHITE DELPH EXTENSION MINE, Clarkfork, undergr, Ag, Pb
Gen Mgr: Svea A Anderson
Idle

WHITEDELP MNG & DEVEL CO
Clarks Fork
Pres & Mgr: Compton I White, Jr
VP: W W von Cannon
Sec: E I Fisher
WHITEDELP MINE, 2 mi N of Clarks Fork, undergr, Ag, Pb, Au, Zn
50-TON FLOT MILL

WHITE KNOB MNG CO
Newhouse Bldg, Salt Lake City, Utah
Pres: G A Gleaster
HOMESTAKE, COPPER QUEEN MINES, Alder Creek, Mackay, Pb, Zn, Ag

WILBERT MINING CO
316 Kearns Bldg, Salt Lake City, Utah
Pres & Treas: R J Hogan
VP: M F O'Reilly
Sec: Claude Engberg
DAISY BLACK GROUP, 35 mi E of Howe, undergr, Pb, Zn
Idle
75-TON CONC
Idle

WILSON, E S
Dubois
HARD ROCK MINE, Clark County, Pb
Under devel

WINDMAISER, FRANK
Golden
MOORE CREEK MINE, Idaho County, Au

YOUNG, RULON
Salmon
GRANDVIEW #1 & 2, Lemhi County, Au, Ag, Cu

ZANETTI BROS
Wallace
BIG CREEK, OSBURN & DeBLOCK TAILINGS, Evolution dist, Shoshone County, Ag, Pb, Zn, Cu

ZOOK, JOE E
Leadore
RAINBOW MINE, Ada County, Au, Ag, Cu, Pb

ILLINOIS

ALUMINUM CO OF AMERICA
Alcoa Bldg, Pittsburgh 19
Pres: I W Wilson
VP (Mng Divn: L Litchfield, Jr
FAIRVIEW-BLUE DIGGINGS
Rosiclare
Gen Supt: W S Skeels
Geol: F E Williams
Mech Eng: H E Ebner
Met: W C Lay
Purch Agt: T H Fellwell
MINE, undergr, CaF_2, Pb, Zn
Mine Supt: W H Harrison, Jr
Mine Frm: L Billington
Chief Eng: S G Dousman
Mine Eng: Walter Gammeter, Jr
Prod: 400 tons
HMS FLOT MILL, at mine
Mill Supt: W C Lay
Asst Supt: T K Loyd
(See Ark, Penn)

AMERICAN COLLOID CO
Merchandise Mart Plaza
Chicago 54
Pres & Gen Mgr: Paul Bechtner
VP & Treas: W D Weaver
VP: E P Weaver
VP: Clyde A Sanders
Asst Sec: Jeanette Salmon
Purch Agt: Roy H Harris
(See Miss, S Dak, Wyo)

AMERICAN SMELTING & REFINING CO
Federal
FEDERAL SMELTER, Pb
Mgr: L J Buck
Supt: James H Voss
(See Ariz, Calif, Colo, Idaho, Kans, Mich, Mont, Nebr, N J, N Mex, N Y, Okla, Tex, Utah, Wash and Federal Mng & Smelting Co, Mo)

AMERICAN ZINC CO OF ILLINOIS (Subsid of AMERICAN ZINC, LEAD & SMELT CO)
1515 Paul Brown Bldg, St Louis 1, Mo
SMELTER, Fairmont City, Roasting & by-product plant
VP & Gen Mgr: G L Spencer, Jr
Gen Supt: George Kromer
Purch Agt: G E James
ELECTROLYTIC SMELTER, Monsanto
Mgr: L P Davidson
Gen Supt: T I Moore
Purch Agt: V M Provow
Prod: 54,000 tons hi-grade slab zinc annually
SMELTING & PROCESSING PLANT, Hillsboro
Mgr: H R Wampler
Met Div Supt: J P Clark
Gen Frm: H J Collett
Oxide Supt: Oscar Hassel
Assay: Orville Rutledge
Prod: 12,000 tons Amer prod zinc oxide yrly
2,700 tons Fr prod zinc oxide yrly
7,150 tons slab zinc yrly
(See Ariz, Mo, Ohio, Okla, Tenn, Tex, Wash, Wisc)

CALUMET & HECLA, INC
People's Gas Bldg, 122 S Michigan Ave, Chicago 3
Pres: E R Lovell
Exec VP: H Y Bassett
(See Mich)

EAGLE PICHER CO, MNG & SMELTING DIV
Miami, Oklahoma
GRAHAM MINE, Galena, undergr, Zn, Pb
Gen Mgr: R L Haffner
Gen Supt: H H Haman
Geol: H Calloway
Met: Albert Thayler
Maint Supt: T A Ray
Maint Frm: Clarence Lyden
Mine Supt: E L Houy
Mine Frm: Harold Wisco
Mine Eng: H B Farrey
Prod: 600 tons
GRAHAM MILL, Galena, flot & grav
Mill Supt: C C Crow
Mill Frm: Glen Brannan
Assayers: Ed O'Niel & Richard Simmons
Prod: 1,500 tons of Zn daily
(See Ariz, Kans, Nev, Ohio, Okla, Wisc)

FLANDERS MNG CO
(Subsid of PACIFIC INDUSTRIES INC)

EGYPTIAN MNG CO
Pres: B Burgess
EMPIRE MINE, Pope County CaF_2

GOOSE CREEK MNG CO
10 Public Square, Belleville
Sec-Treas: C D Blair
MINE, near Cave in Rock, CaF_2

HICKORY HILL MNG CO
Galena
MINE, Pb, Zn

HICKS CREEK FLUORSPAR MINING CO
Elizabethtown
Pres: John C Humm
VP: Ted Joiner
Sec: Clyde L Flynn, Jr
Treas: M L Conn
DOUGLAS MINE, Pope Co, CaF_2
Prod: 50 tons

HOEB MNG CO
Cave in Rock
Sec: Lowell Oxford
MINE, CaF_2

INLAND STEEL CO
First Nat'l Bank Bldg, Chicago 3
Pres: Joseph Block
VP, Raw Materials: P D Block, Jr
Sec: Graydon Megan
Treas: W H Lowe
(See Ky, Mich, Minn)

INTERNAT'L MINERALS & CHEMICAL CORP
CONSOL FELDSPAR DEPT
20 N Wacker Dr, Chicago 6
Pres: Louis Ware
VP, Ind Min Div: Norman J Dunbock
Mgr, Consol Feldspar Dept: E W Koenig
Asst Mgr: Phil Blasovic, Jr
Exec VP: J P Margeson, Jr
VP's: G W Moyers, M H Lockwood, P D V Manning, George Hamilton, N J Dunbock, Howard F Roderick, H C White
VP & Treas: A R Cahill
VP & Gen Counsel: E D McDougal, Jr
Admin VP: T M Wurs
Corp Sec: C M Edwards
Purch Agt: J P Burrows
(See Ariz, Colo, Fla, Mo, Miss, N Mex, N C, Ohio, S D, Tenn, Va, Wyo)

MACKEY-HUMM FLUORSPAR MNG CO
Box 336, Golconda
MINE, Humm's Wye, CaF_2
BEAV-MEDIA MILL, at mine

MATTHIESSEN & HEGELER ZINC CO
LaSalle
LaSALLE WORKS, Zn
Pres: H D Carus
VP & Gen Mgr: C R MacDrayne
Sec: E H Carus
Treas: H D Carus
Gen Supt: R Waszkowiak
Mech Engr: H Larson
Safety Engr: V Novak
Purch Engr: A La Flamme
SMELTER (Retort)
Capacity: 32,000 tons Zn per yr

MINERVA OIL CO, FLUORSPAR DIV
Div'n Off: Myers Bldg, Box 531 Eldorado
VP & Gen Mgr: Gill Montgomery.
Pur Agt & Sls Mgr: S J Kelly
MINERVA MINE NO 1, Cave-in-Rock, undergr, CaF_2, ZnS
Prod: 325 tons per day
Mine Supt: C F Callahan
Mine Frm: Joseph Doggett
Eng: D B Holbrook
Mng Eng: J J Daly
Geol: Donald W Saxby
250-TON FLOT MILL: CaF_2, Zn conc
Mill Supt: Wm Rule
Chem: C B Rash
Assayer: A C Reed
CRYSTAL MINE, Rt 1, Elizabethtown, undergr, CaF_2
Plant Mgr: I V Robertson
Mine Frm: Raynard Dutton
Prod: 200 tons per day
750-TON HMS and FLOT MILL, met. grade & acid grade fluorspar; Crystal mill: Acid & ceramic & met fluorspar; zinc & lead concentrate
Mill Frm: Jas Frailey
Met: D C Spees
VICTORY MINE, Rt 1, Elizabethtown, undergr, CaF_2, 300 tons per day to Crystal mill
JEFFERSON MINE, Rt 4, Golconda, undergr, CaF_2
Idle
ROSE CREEK MINE, near Hered, undergr, CaF_2
Idle
(See Mo)

MORTON SALT CO
120 S LaSalle St, Chicago 3

OZARK - MAHONING CO, MNG DIV
Box 57, Rosiclare
VP & Gen Mgr: A G Johnson
Purch Agt: C W Sobosky
DEARDORFF, W L DAVIS #2, NORTH GREEN, EAST GREEN, MAHONING MINES, SHAFT #2, 3, 5, 11, 16 & HILL-LEDFORD, undergr, fluorspar, Zn, Pb
Gen Supt: H E Bailie
Geol: E A Brecke
Met: R A Sperberg
Elec Eng: H D Davis
Mine Supt: Edward Powell, Jr
Asst Mine Supt: V G Smith
Mine Frm: J H Scott
Prod: 400 tons
400-TON FLOT MILL, at mine
Mill Supt: W W Fowler
Asst Mill Supt: R H Herman
Mill Frm: F N Hobbs, P H Baker
Assay: Wm Smith
(See Colo, Ky, N Mex, Okla)

REDD MNG CO
R F D #4, Golconda
HAMP MINES, northern Hardin County CaF_2

ROSICLARE LEAD & FLUORSPAR MNG CO
Rosiclare
Pres: J Blecheisen
VP: Stanley Holland
Sec-Treas: A T Souder
Cashier: R A Browning
MINE, undergr, fluorspar
Prod: 300 tons
300-TON FLOT MILL, at mine
Idle
(See Ky)

SWIFT & CO
Union Stock Yards, Chicago
(See Fla)

TAMORA MNG CO
Rosiclare
MINE, Pope County, CaF_2

TRI - STATE ZINC, INC
70 Pine St, New York, N Y
Pres: R F Playter
VP: V C Allen
Sec-Treas: J H Nicholls
GRAY MINE OPERATION, Galena, undergr, Zn, Pb
Gen Mgr: V C Allen
Gen Supt: Paul Herbert, Jr
Mine Supt: Joseph J Nolan
Mine Frm: Orville W Liches
Prod: 1,000 tons
1,000-TON FLOT-GRAV MILL, Galena
Mill Supt: Dorsey E Hammock
(See N Y, Va)

U S GYPSUM CO
300 W Adams St, Chicago 6
Chrm Bd: C H Shaver
Pres: O M Knode
VP, Op: E Rembert
VP, Manufact: C W Desgrey
Sec-Treas: F L Stellner
VP, Purch: H C Bear
Mgr Mines: F C Appleyard
(See Calif, Colo, Conn, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Tex, Utah, Va)

VICTOR CHEMICAL WORKS
155 N Wacker Dr, Chicago 6
Pres: Rothe Weigel
VP: F M Anable, T G Everett, M R Stanley
Sec: F W Hansen
Treas: F S Schwerdt
Purch Agt: Walter Weise
(See Fla, Mont)

ZONOLITE CO
135 La Salle St, Chicago
Pres: John B Myers
VP: Dayton L Prouty, Daniel J Beene, Joe A Kelley, Robert W Sherrett
VP & Treas: Walter J Bein
Purch Agt: Leo O Frear
(See Mont)

INDIANA

NATIONAL GYPSUM CO
325 Delaware Ave, Buffalo 2, N Y
MINE, Shoals, undergr, gypsum
Pl Mgr: M B Turner
Mine Supt: Max Abrams
Prod: 1,300 tons
MILL, at mine
(See Iowa, Kans, Mich, N Y, Ohio, Pa, Tex, Va)

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
MINE, Shoals, undergr, gypsum
Works Mgr: J R Burns
(See Calif, Colo, Conn, Ill, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Tex, Utah, Va)

IOWA

BALD MOUNTAIN MNG CO
Clinton
Pres: O D Collis
Sec-Treas: W H Reidesel
(See S Dk)

BESTWALL GYPSUM CO
Fort Dodge
MINE & PLANT, gypsum
(See Ky, Mich, N Y, Pa, Tex, Utah)

FORT DODGE GYPSUM CO
Fort Dodge
NO 1 MINE, gypsum

NAT'L GYPSUM CO
Fort Dodge
QUARRY & PLANT, gypsum
Plant Mgr: J B Pitts, Jr
Mine Supt: Wm Causey
Prod: 1,000 tons
(See Ind, Kans, Mich, N Y, Ohio, Pa, Tex, Va)

NORTHWEST GYPSUM CO
Fort Dodge

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
OPEN QUARRY, Ft Dodge, gypsum
Works Mgr: M E Davidson
(See Calif, Colo, Conn, Ill, Ind, Mass Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Tex, Utah, Va)

KANSAS

AMERICAN ROCK CRUSHER CO
3700 Rainbow Blvd, Rosedale, Kansas City 3
UNDERGR WKINGS, limestone

AMERICAN SALT CORP
630 N Y Life Bldg, Kansas City 5, Mo
SALT MINE, Lyons, undergr, evapor

AMER SMELT & REFIN CO
Baxter Springs
Gen Supt: W C Bell
MINE, undergr, Zn, Pb
Idle
(See Ariz, Calif, Colo, Idaho, Ill, Md, Mont, Nebr, N J, N Mex, N Y, Tex, Utah, Wash, & Federal Mog & Smelting Co, Mo)

BARTON SALT CO
Hutchinson
Pres: C H Humphreys
SALT MINE, Evaporated

BROWN MNG CO
1734 Park Ave, Baxter Springs
MINE, 1 mi W of Baxter, undergr, Zn, Pb

C & M MINING CO
Box 239, Baxter Springs
Supt: H G Milligan
ST LOUIS #4, IMBEAU MINES, undergr, Zn, Pb
200-TON GRAV-FLOT MILL

CAREY SALT CO
Box 913, Hutchinson
Pres: H J Carey, Jr
VP: W D P Carey
Sec: D F Johnson
Treas: R N Apple
Purch Agt: F L Johnson
MINE, Hutchinson, undergr, salt
Prod: 1, 000 tons
Gen Mgr: Lee Reid
Mech Eng: Ron Sims
Mine Supt: Everett Roberts
MILL, Hutchinson
Mill Supt: C Millard
(See La)

CASSELL MNG CO
811 Sergeant Ave, Joplin, Mo
Gen Mgr: J W Atherton
MINE, SE of Baxter Springs, undergr Zn, Pb
(Formerly Ajax Mng Co)

EAGLE PICHER CO, MNG & SMELT DIV
Cardin, Okla
LUCKY JEW, BIG JOHN BILHARZ, GRACE B, WEBBER, WESTSIDE, Zn, Pb
LEAD SMELTER & ACID PLANT
Galena
Mgr: Fred Clearman
(See Ariz, Ill, Nev, Ohio, Okla, Wisc)

GARNETT ROCK CO
Garnett
Own: E F Brosshan
UNDERGR WORKINGS, limestone

HELEN H MINING CO
Box 326, Baxter Springs
Mgr: Claude Jones
MINES, Baxter Springs, Kans & Picher-Cardin, Okla areas, undergr, Zn, Pb

HENDERSON, JOHN
326 E Broadway, Miami, Okla
MINE, Wilbur (subleased from Eagle Picher), undergr, Zn, Pb

INDEPENDENT SALT CO
4115 Pachers Ave, Chicago, Ill
SALT MINE, Kanopolis, undergr

G W KERFORD QUARRY CO
Rt 1, Atchison
UNDERGR WORKINGS, limestone

LITTLE BEN MNG CO
c/o Kenneth Childress, Box 220, Baxter Springs

LORING QUARRIES CORP
Bonner Springs
UNDERGR WORKINGS, Loring

MARK TWAIN MNG CO
Picher, Okla
Supt: Harold Childress
MINE, undergr, Zn, Pb

MASON MNG CO
1018 Park, Baxter Springs
MINE, 1 mi W of Baxter, undergr, Zn, Pb

MID-CONTINENT LEAD & ZINC CO
1101-1/2 Military, Baxter Springs
Pres: Kenneth Childress
MINES, WRIGHT LAND GROUP AND JARRETT MINE

MORTON SALT CO
120 S La Salle, Chicago 3, Ill
SALT MINE, Hutchinson, evapor

NANCY JUNE MNG CO
Box 14, Baxter Springs
Supt: W E Grayson
ROBERTSON MINE, 11 mi W of Baxter, undergr, Zn, Pb

NAT'L GYPSUM CO
Medicine Lodge
MINE & PLANT, gypsum
Plant Mgr: D C Chads
Mine Supt: Brad Saboda
Prod: 1, 000 tons
(See Ind, Iowa, Mich, N Y, Ohio, Pa Tex, Va)

NATIONAL LEAD CO
Box 30, Baxter Springs
TRI STATE OPERATIONS
Gen Supt: Geo R Schaefer
Met: Corbin Marsh
BALLARD, HARTLEY, SHANKS, KEITH, SWALLEY, SMITH, CLARK MINES, undergr, Pb, Zn
Prod: 7, 400 tons
3, 500-TON GRAV-FLOT MILL
Mill Supt: W F Fraendenberg
(See Ark, Calif, La, Mont, Mo, Nev, N Y, Tenn, Tex, Wyo)

RACE TRACK MNG CO
Box 29, Baxter Springs
Supt: C G Marquis
MINE, W of Baxter, undergr, Zn, Pb

SEARCY & HENDERSON MNG CO
Box 281, Picher, Okla
BENDELARI MINE, NW of Picher, undergr, Zn, Pb
WILBUR MINE, Near Treece, undergr, Zn, Pb
Supt: D W Searcy

SHEERAN MNG CO
1136 Elm St, Miami, Okla
MINE, 1/4 mi NW of Treece, undergr, Zn, Pb

THOMPSON STRAUSS QUARRIES
Rt 2, Kansas City 6
MINE, Morris, undergr limestone

W M & W MNG CO, INC
Box 306, Picher, Okla
Pres: O K Tucker
VP: F E Williams
Sec & Treas: Ralph Chambers
Purch Agt: O K Tucker
FLOT MILL, 2 mi NW of Baxter Springs

WOOD & SHIRA MNG CO
549 W "A" St, Picher, Okla
Supt: Mr Wood
OLD QUEEN ESTHER MINE, 1 mi S, 2 mi W of Baxter, undergr, Zn, Pb
(Formerly Bagnin & Johnson)

KENTUCKY

BESTWALL GYPSUM CO
120 E Lancaster Ave, Ardmore, Pa
MINE, Blue Rapids, undergr, gypsum
(See Iowa, Mich, N Y, Pa, Tex, Utah)

INLAND STEEL CO
Marion
FLUORSPAR OPER
Supt: W G Robinson
(See Ill, Mich, Minn)

KENTUCKY FLUORSPAR CO
Marion
Pres: R N Frazer
VP: Frank Stegeman
Sec-Treas: Sam Gugenheim
Purch Agt: E W Frazer
TWO 100-TON FLOT MILLS, Marion
TWO 5-TON HEAV-MED MILLS, Marion
Mill Supt: E W Frazer

LIVINGSTON MNG CO
P O Box 202, Marion
Pres: Wm Howard Crider
VP: Rodge Winters
Sec-Treas: Howard Stout
NANCY HANK MINE, Salem, undergr, CaF_2
Under devel

OZARK-MAHONING CO, MNG DIV
P O Box 443, Tulsa 1, Okla
MINERAL RIDGE MINE, CaF_2
(See Colo, Ill, N Mex, Okla)

PENNSYLVANIA SALT MNG CO
Marion
DYERS HILL SHAFT, undergr, CaF_2
MILL, at mine

ROSICLARE LEAD & FLUORSPAR MNG CO
Rosiclare, Ill
PIGMY MINE, Crittendon County, CaF_2
Under devel
(See Ill)

LOUISIANA

CAREY SALT CO
Winnfield
MINE, Winnfield, undergr, salt
Mgr: W H Cameron
Supt: Al Tracy
Mech Eng: J M Thornton
Mine Fgmn: J E Austin
Prod: 600 Tons
MILL, at mine
(See Kans)

FREEPORT SULPHUR CO
161 E 42nd St, New York 17, NY
LOUISIANA DIV, American Bank Bldg, New Orleans, mines at Grande Ecaille, Garden Island Bay, Bay Ste Elaine, S Chacahoula
VP & Div Mgr: K T Price
(See N Y)

JEFFERSON LAKE SULPHUR CO
1408 Whitney Bldg, New Orleans 12
Pres: E H Welst, Jr
VP: H A Wilson, F E Lewis
VP & Sec: Chas J Ferry
VP & Treas: L L Lasselle
Purch Agt: Carl E McElrath
VP's: J T Pilee, E B Miller, H W Manley
STARKS DOME, Calcasieu Parish, So
(See Tex)

NATIONAL LEAD CO
New Orleans
BARITE PLANT, dry grinding
Plant Supt: D M Middleton
(See Ark, Calif, Kans, Mont, Mo, Nev, N Y, Tenn, Tex, Wyo)

MAINE

BELL MINERALS CO
West Paris
PERHAM MINE, Oxford County, feldspar
Gen Mgr: H W Childs

INTERNAT'L MIN & CHEM CORP
20 N Wacker Dr, Chicago, Ill
FELDSPAR MINE, Topsham
Gen Supt: J C Brannigan
Prod: 50 tons
(See Ariz, Colo, Fla, Ill, Miss, N Mex, N C, Ohio, Tenn, Va, Wyo)

TOPSHAM FELDSPAR CO
Topsham
Pres: E W Hooker
Gen Supt: D R Diremo
MINES, Sagadahoc County, feldspar
Idle
MILL, Topsham

WHITEHALL CO, THE
17 Battery Pl, New York 4, N Y
MINES, Oxford County, feldspar
(See N H)

MARYLAND

AMERICAN SMELTING & REFINING CO
Highland & Eastbourne Aves, Baltimore 24
BALTIMORE PLANT
Mgr: A J Kleff, Jr
(See Ariz, Calif, Colo, Idaho, Ill, Kans, Mont, Nebr, N J, N Mex, N Y, Tex, Utah, Wash, Federal Mng & Smelt Co, Mo)

DAVISON CHEM CORP, THE
101 N Charles St, Baltimore 3
Pres: M G Geiger
VP: W E McGuirk, Jr
Sec: M C Roop
Treas: J C Marks
Purch Agt: C C Dorsey
(See Fla)

POWHATAN MNG CO
6721 Windsor Mill Rd, Baltimore 7
Pres & Gen Mgr: F A Mett
VP & Sec: C Silver
Treas: E L Farley
Off Mgr: F E Mett
(See Calif, Ga)

UNITED CLAY MINES CORP
Poplar
MINE #3, open pit
Mine Supt: Arthur Simmons
Mine Eng: H Michael Bress
(See Fla, Ga, N J, Tenn, SC)

MASSACHUSETTS

COPPER RANGE CO
24 Federal St, Boston 10
Pres: J P Lally
VP: Nelson J Darling, Jr, John V O'Connor, J S Leonard
Sec: J R Ackroyd
Treas: D M Goodwin
Purch Agt: S H Bailey
(See Copper Range, Mich, White Pine Copper Co, Mich)

U S SMELTING, REFINING, & MNG CO
75 Federal St (Box 2137), Boston
Pres: F S Mulock
(See Alaska, Ariz, Utah)

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
MINE, Farnams, open pit, limestone
Works Mgr: E E Long
(See Calif, Colo, Conn, Ill, Ind, Iowa, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Tex, Utah, Va)

WHITE PINE COPPER CO
24 Federal St, Boston 10
Pres: J P Lally
VP: D R Straub
Sec: J R Ackroyd
Treas: D M Goodwin
Purch Agt: Russell Baird
(See Copper Range Co, Mich & White Pine Copper, Mich)

MICHIGAN

BESTWALL GYPSUM CO
120 E Lancaster Ave, Ardmore, Pa
GRAND RAPIDS MINE, 2228 Butterworth Rd SW, undergr, gypsum
Gen Mgr: A H Ten Eishof
Asst Gen Mgr: E J Reverski
Mine Supt: H W Nielsen
Asst Mine Supt: H R Busby
Mech Eng: J H Vanden Houten
Prod: 670 tons daily
MILL, Grand Rapids
Mill Supt: F M Bigelow
(See Iowa, Ky, N Y, Pa, Tex, Utah)

CALUMET & HECLA, INC, CALUMET DIV
1 Calumet Ave, Calumet
VP & Gen Mgr: A S Kromer
Dir of Purch: W A Dars
Dir, Ind & Pub Rel: H D Stott
NO 3 AHMEEK, ALLOUEZ, CENTENNIAL NO 2, IROQUOIS, AHMEEK NO 2, PENINSULA, SENECA, OSCEOLA NO 13, Calumet, undergr, Cu
Dir, Mng: C A Campbell
Ch Geol: J P Pollock
Proj & Specif Eng Mgr: P H Outlender
Mech Proj Eng: R R Spencer
Elec Proj Eng: A W Hill
Civil & Min Eng: H S Donald
Prod: 8, 000 tons
8, 000-TON GRAV-FLOT MILL
Dir, Mlg: R K Peall
CALUMET & HECLA SMELTER
Hubbell, 5 reverb Cu furnaces
Dir, Smelig & Ref: K F Farley
Prod: 90, 000, 000 lbs Cu yrly
OSCEOLA NO 6 MINE, Calumet, undergr, Cu
Under devel
CENTENNIAL NO 2 MINE, Calumet, undergr,
Explor
CALEDONIA MINE, Greenland, undergr, Cu
Explor
(See Ill)

THE CLEVELAND-CLIFFS IRON CO, ORE MNG DEPT
Ishpeming
Gen Mgr: G J Holt
MICHIGAN OPER, Ishpeming
Mgr, Mich Mines: J S Westwater
Dist Supt, Undergr Mines: H B Korpinen
Dist Supt, open pit Mines: H C Swanson
OHIO-WEBSTER MINE, Baraga County, surface, Fe
Supt: W Rembold
BUNKER HILL-MAAS MINE, Marquette County, undergr, Fe
Supt: T A Kauppila
CAMBRIA-JACKSON, Marquette County, undergr, Fe
Supt: R L Tobie
CLIFFS SHAFT, Marquette County undergr, Fe
Supt: O Marjamo
MATHER MINE, Marquette County, undergr, Fe
Asst Supt, "A" Shaft: Gil Dawe
Asst Supt, "B" Shaft: R L Tobie
Unsg Supt, "A" & "B" Shafts: A J Andelin
TILDEN MINE, Marquette County, surface, Fe
Supt: W Rembold
HUMBOLDT MINE, Marquette County surface, Fe
Supt: K C Olson
REPUBLIC MINE, Marquette County surface, Fe
Supt: E W Lindroos
Under devel
RESEARCH LAB, Marquette County Ishpeming
Ch Met: L J Erck
Proj Eng: D K Campbell
PELLETIZING PLANT, Marquette County
Supt: Calvin Bjorne
ORE IMPROVEMENT PLANT, Marquette County
Supt: Robert DeGabriele
MNG METHODS RESEARCH DEPT
Supt: John M Hatvala
(See Minn, Ohio)

COPPER RANGE CO
24 Federal St, Boston 10, Mass
CHAMPION MINE, Painesdale, undergr, Cu
Mine Supt: L Copobianco
Elec Eng: M Myers
FLOT MILL, Freda
Supt: Ross Gamble
(See Mass, Copper Range Co & White Pine Copper Co)

GRAND RAPIDS PLASTER CO
1204 Peoples Nat'l Bank Bldg, Grand Rapids
Pres: W C Chick
VP: Mabel C Fess
Sec: Donald G Stevens
Treas: James Hale
MINE, undergr, gypsum
Gen Mgr: James Bale
Gen Supt: George Fischer
Mine Supt: Charles E Johnston
Mech Eng: Lewis A White
Prod: 750 tons
1,000-TON GYPSUM MILL, Walker Township, Kent County

HANNA COAL & ORE CORP
Iron River
Mgr, Mich Mines: S E Quayle
Gen Mgr: R W Whitney
Gen Supt: W F Shinnors
Geol: A E Walker
Mech Eng: Warren W Jamar
Elec Eng: Carl W Anderson
Purch Agt: G E Tremblay
WAUSECA MINE, undergr, Fe
Mine Supt: J D McAuliffe
Mine Captain: W A Landwall
Prod: 2,000 tons
(See Minn, Ohio)

HANNA IRON ORE CO
Iron River
Mgr, Mich Mines: S E Quayle
Gen Mgr: R W Whitney
Gen Supt: W F Shinnors
Geol: A E Walker
Mech Eng: Warren W Jamar
Elec Eng: Carl W Anderson
Purch Agt: G E Tremblay
CANNON MINE, Stambaugh, undergr Fe
Mine Supt: G A Koehler
Prod: 1,900 tons
HIAWATHA MINE, Iron River, undergr, Fe
Mine Supt: J B Quayle
Prod: 2,050 tons
HOMER MINE, Iron River, undergr, Fe
Mine Supt: Kurt Kuehlthau
Prod: 1,500 tons
(See Minn, Ohio)

INLAND STEEL CO, IRON ORE OPER
624 S Pine St, Ishpeming
Pres: Joseph L Block
Sen VP: P D Block, Jr
Sec: Graydon Megan
Treas: W H Lowe
MORRIS & GREENWOOD MINES, Ishpeming
SHERWOOD MINE, Iron River
BRISTOL MINE, Crystal Falls, undergr, Fe
Mgr, Ore Mines: R D Batterley
Asst Mgr, Ore Mines: H M Graff
Geol: A T Broderick
Mech Eng: J R Gronseth
(See Ky, Ill, Minn)

JACKSON IRON & STEEL CO
Iron Mt
BRADLEY MINE, Fe
Prod: 34,119 tons per year
(Operated by Edward C Bradley & Sons)

JONES & LAUGHLIN STEEL CORP, MICHIGAN ORE DIV
Negaunee
TRACY MINE, undergr, Fe
Gen Mgr: R W Braund
Gen Supt: R L Balconi
Mech Eng: Michael Kercsmar
Elec Eng: John B Motto
Mine Frm: R L Prideaux
Mine Eng: Wm A Benson
Under devel
(See Minn, N Y, Pa)

NATIONAL GYPSUM CO
325 Delaware Ave, Buffalo 2, N Y
QUARRY & PLANT, National City, Gypsum
Quarry Supt: Adam Berhenbrock
Plant Mgr: C H Hill
Prod: 1,000 tons
(See Ind, Iowa, Kans, N Y, Ohio, Pa Tex, Va)

NORTH RANGE MNG CO
Negaunee
Pres & Gen Mgr: R S Archibald
Ch of Bd: F P Rand
VP: R Q Archibald
VP, Oper: F J Haller
Sec: E S Holmgren
Ch Elec: G H Peterson
Gen Supt: J C Kirkpatrick
Purch Agt: S M'Archibald
BOOK MINE, Alpha
Supt: J A Nicolson
Capt: Charles Coole
CHAMPION MINE, Champion
Oper Eng: M J Marin
Capt: Bryan Farragh
WARNER MINE, Amasa
Supt: J A Nicolson
Capt: C A Clements
LEONIDAS MINE, Eveleth
Supt: A J Guscatt
Capt: Ward Brown
PENOKEE, Ironwood
Supt: J Zuraw
Capt: Wm Bianchi

PACIFIC ISLE MNG CO
2521 First Ave, Hibbing, Minn
WAKEFIELD MINE, Wakefield, surface, Fe
(See Minn)

PICKANDS MATHER & CO, (MANAGING AGENTS)
Gogebic Dist, Ironwood
Gen Supt: W A Knoll
Asst Gen Supt: C D Bailey
Dist Mng Eng: J L Sharrer
Chief Clerk: A W Bulinski
Dist Safety Supt: George Gerry
YOUNGSTOWN MINES CORP, ANVIL-PALMS-KEWEENAW MINE, Bessemer, undergr
Asst Supt: A J Cigallio
MAUTHE MNG CO, NEWPORT MINE, Ironwood, undergr
Asst Supt: L G Woodworth
MAUTHE MNG CO
GENEVA MINE, Ironwood, undergr
Supt: R L Jose
PURITAN MNG CO, PETERSON MINE, Bessemer, undergr
Supt: P P Torreano
SUNDAY LAKE IRON CO, SUNDAY LAKE MINE, Wakefield, undergr
Supt: R D Hodge
MENOMINEE DIST, Caspian
Supt: W E Seppanen
Dist Mng Eng: R Brewer
Chief Clerk: S K Drew
VERONA MNG CO
BUCK & LAWRENCE MINES, Caspian, undergr
FORTUNE LAKE MINE, PICKANDS MATHER & CO, Managing Agents, Crystal Falls, surface
(See Minn, Wisc)

REPUBLIC STEEL CORP
Genl Off: Republic Bldg Cleveland 1, Ohio
Dist Off: 304 Sellwood Bldg Duluth 2, Minn
Dist Mgr: P E Cash
Acting Ch Mng Eng: S C Howell
Ch Mech & Elec Eng: I V Crego
TOBIN-COLUMBIA-MONONGAHELA MINE, Crystal Falls, undergr, Fe
Mine Supt: E H Anderson
Mine Frm: Emil Johnson
Assay: J Trevarthan
Prod: 250,000 tons per year
(See Ala, Minn, N Y, Ohio)

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
OPEN QUARRY, Alabaster, gypsum
Works Mgr: M H Van Orsum
(See Calif, Colo, Conn, Ill, Ind, Iowa, Mass, Mont, N Mex, Nev, N Y, Ohio, Okla, Tex, Utah, Va)

WHITE PINE COPPER CO
24 Federal St, Boston 10, Mass
WHITE PINE MINE, White Pine, undergr, Cu
Gen Mgr: David R Straub
Geol: John J Pritts
Met: Virgil L Lessels
Elec Eng: John A Roller
Mine Supt: Richard P Moe
FLOT MILL, White Pine
Mill Supt: Ivan T Bowman
REVERB SMELTER, White Pine
Supt: Robert C Brinton
(See Copper Range Co & White Pine Copper Co, Mass)

MINNESOTA

BRADFORD MNG CO
(See Pacific Isle Mng Co)

BUTLER BROS
Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Cuyuna Range, Minn, Fe, Mn
ALGOMA RESERVE, Cuyuna
Idle
HUNTER, WHITMARSH RESERVE, Wolford Twp,
Idle
KONA, FED RESERVE, Cuyuna
Idle
MERRITT GROUP, MANGANESE-TROMMALD
Idle
MINES, Mesabi Range, Minn, Fe
ALEXANDRIA RESERVE, Balkan Twp
Idle
AROMAC, THEODORE RESERVE, Nashwauk Twp,
Idle
BURRALL RESERVE, Hibbing
Idle
CAROL, LARUE, MACE #2 RESERVE, Nashwauk, Nashwauk Twp
Idle
GALBRAITH, GALBRAITH ANNEX MINE, Nashwauk Twp
HARRISON, HALOBE, HOADLEY, NORTH HARRISON, NORTH HARRISON ANNEX, QUINN GROUP MINE, Nashwauk, Nashwauk Twp, Cooley
PATRICK ANN, PATRICK ANNEX, KEVIN, LANGDON, DAVID, SNYDER GROUP MINE, Cooley, Greenway Twp
WYMAN MINE, Nashwauk Twp
MIDWEST GROUP MINE, Nashwauk, Nashwauk Twp
MACKILLICAN MINE, Nashwauk
(See Ohio)

CHARLESON IRON MNG CO
P O Box 338, Power Bldg, Hibbing
Pres & Sec: C H Remer
VP & Purch Agt: A T Steele
Treas: E F Remer

CHATACO MNG CO
(See Pacific Isle Mng Co)

THE CLEVELAND-CLIFFS IRON CO, ORE MNG DEPT
Hibbing
Gen Mgr: G J Holt
MINNESOTA OPER, Hibbing, Fe
Mgr, Minn Mines: H J Leech
Gen Supt: W A Pakkala
SARGENT MINE, Keewatin, undergr & surface
Supt, Surface: Paul P Swanson
HAWKINS MINES, Nashwauk, surface
WASH PLANT, H M S PLANT
Supt: William LeClair
HILL-TRUMBLE MINE, marble, surface
WASH & H M S PLANT, Calumet
Supt: A E Hill
HOLMAN-CLIFFS MINE, Coleraine, surface
Supt: J J Foucault
WASH & H M S PLANTS, Coleraine
Supt: J J Foucault
WANLESS MINE, Buhl, surface
Supt: Mel Viant
CANISTEO MINE, Coleraine, surface, wash, H M S Plant
Supt: Ronald Pearson
(See Mich, Ohio)

CONSUMERS ORE CO
Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Mesabi Range, Fe
SARGENT RESERVE, Calumet
Idle
(See Ohio)

COONS PACIFIC CO
Box 27, Eveleth
Pres: H H Harrison
Supt: D C Kimball
CUSTOM IRON ORE CONCEN 6,000 TON GRAV-HEAVY MEDIA MILL, Eveleth
Supt: D C Kimball
(See Pacific Isle Mng Co)

DOUGLAS MINING CO
Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Mesabi Range, Fe
DOUGLAS, DUNCAN GROUP MINE, Balkan Twp
NEVILLE RESERVE, Stuntz Twp,
Idle
SHENANGO RESERVE, Chisholm
Idle
(See Ohio)

EALEY-YOUNG MNG CO
2223 First Ave, Hibbing
Pres: E A Young
Sec-Treas: David D Haley
ELBERN MINE, 2 mi SE of Prasel, surface, Fe
Supt: Leo Cashen
Frm: Michael Molnick
(See Young, E A, Inc, Minn)

HANNA COAL & ORE CORP
Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Fillmore County, Fe
G BLY, H BLY, BREHMER, FENSTERMACHER, FREEMAN, HADLAND, HAFNER, R JOHNSON LASSELL, LEON J McNEE, MEYER NASH, K OLSON, R OLSON, RATHBURN, RICK, SIMON, C TART, W TART, Forrestville Twp, Bloomfield Twp, Beaver Twp
MINES, Cuyuna Range, Fe & Mn
ALSTEAD, ARKO, NORTH HILL-CREST GROUP MINE, Ironton
AUNE SISTERS, PONTIAC GROUP RESERVE, Trommald
Idle
CROFT, MEACHAM GROUP RESERVE, Crosby
Idle
FEIGN MINE, Ironton
HUNTINGTON MINE, Ironton
LAND & COL RESERVE, Wolfred Twp
Idle
NORTHLAND RESERVE, Rabbit Lake Twp
Idle
LOUISE MINE, Irondale Twp
MALLEN MINE, Irondale Twp
Idle
MAROCO MINE, Trommald
RICE RIVER RESERVE, Morrison, Spencer Twp, Aitkin County,
Idle
SECTION 6 MINE, Irondale Twp
Idle
SNOWSHOE MINE, Irondale Twp
Idle
SOUTH HILLCREST MINE, Ironton
MINES, Mesabi Range, Fe
ALLEN ROSSUM RESERVE, Greenway Twp
Idle
ARGONNE, LEACH, PERRY GROUP MINES, Nashwauk Twp, Keewatin
HARTMAN, MARR GROUP RESERVE Bass Brook Twp
MAJORCA RESERVE, Greenway Twp
Idle
SCOTT RESERVE, Greenway Twp
Idle
SILVER, ALPENA GROUP RES, Virginia, unorganized Twp 58 1/2
Idle
SCOTT
(See Mich, Ohio)

HANNA IRON ORE CO
Box 710, Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Cuyuna Range, Fe, Mn
BARROWS RESERVE, Crow Wing Twp
Idle
CUYUNA, DUNN, POLK, TABERT GROUP RES, Oak Lawn Twp

Idle
N W I RESERVES, Crow Wing Twp, Long Lake Twp, Hokay Lake Twp, Oak Lawn Twp
Idle
GLORIA, ZENO RES, MANGANESE
Idle
OMAHA RES, Oaklawn Twp
Idle
ROWE RES, Irondale Twp
Idle
WALKER RES, Hokay Lake Twp
Idle
YAWKEY RES, Crosby, Cuyuna
Idle
PORTSMOUTH GROUP MINE, Crosby MINES, Mesabi Range, Fe
BECKFELT, FINNEGAN, LUNDRIGAN, NATCHEZ, POKEGAMA GROUP RES, Bass Brook Twp
Idle
HUNNER MINE, Coleraine
BILLINGS RESERVE, Fraser
Idle
SECTION 16 MINE, Stuntz Twp
Idle
(See Mich, Ohio)

HANNA ORE MINING CO
Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Mesabi Range, Fe
BOVEY-DeLAITTRE, FARGO GROUP RES, Grand Rapids Twp
Idle
BRAY, GORDON, GORDON ANNEX, MESABI CHIEF, MISSI, STEIN GROUP MINS, Nashwauk Twp, Keewatin
BRUNT RESERVE, Mt Iron
Idle
BUCKEYE, JENNISON GROUP MINE, Arbo Twp
Idle
ENTERPRISE MINE, Virginia
FRANTZ, SHIRAS GROUP RES, Buhl
Idle
NORPAC, IMPRO B, SARGENT GROUP RES, Hibbing
NORTH UNO RES, Stuntz Twp
Idle
WABIGON, THORNE GROUP RES, Buhl, Great Scott Twp
Idle
(See Ohio)

HOLLAND MNG CO
(See Pacific Isle Mng Co)

INLAND STEEL CO, IRON ORE OPER
Iron
ARMOUR NO 1 & NO 2 MINES
Supt A T Anderson
(See Ky, Ill, Mich)

JESSIE H MNG CO
Box 486, Grand Rapids
Pres E W Hallett
VP R H McClifert
JESSIE MINE, 3 mi E of Grand Rapids, open pits, Fe
Mine Supt L R Sewall
Mine Frm: Art Andersen
Mine Eng: J J Walker
Prod: 1,400 tons
2,000-TON MILL, 3 mi E of Grand Rapids

JONES & LAUGHLIN STEEL CORP, MINN ORE DIV
Virginia
Mgr H F Kullberg
Ch Acct: F S Tonneson
Proj Eng: W F Gaspar
Res Geol: T E Stephenson
Eastern Dist Supt P W Kruse
Western Dist Supt J F Linden
Super Maint Dan Madich
MINES, Mesabi Range, surface, Fe
HILL ANNEX MINE AND MILL, Calumet
Dist Supt: J F Linden
Mine Supt Wm Ball
Mill Frm R L Abercrombie
LONGYEAR MILL & MINE, Hibbing
Dist Supt. J F Linden
Mine Supt J Strande
LIND-GREENWAY MINE, Coleraine
Dist Supt: J F Linden
Mine Supt. Wm Ball
Under devel
COLUMBIA MINE & MILL, Virginia
Dist Supt: P W Kruse
SCHLEY-PETTIT MINE & MILL, Gilbert
Dist Supt P W Kruse
WESTWORTH MINE & MILL, Mesabi
Dist Supt P W Kruse
(See Mich, N Y, Pa)

LITHIUM CORP OF AMERICA INC
Rand Tower Bldg, Minneapolis, Minn
Pres: Herbert W Rogers
VP: Fremont P Clarke
Sec: Salisbury Adams
Treas: W W Osborne
Purch Agt: John W Douglas
Asst: Fred Dixon
(See N C)

W S MOORE CO
400 Torrey Bldg, Duluth
Pres: W S Moore
Sec: H A Nelson
Geol J V Everett
RANGE OFFICE, Brooklyn Rd, Hibbing
Gen Mgr: M E Reese
Ch Eng: J M Madsen
Gen Supt: John Johnson
Mech Supt: N P Arnold
Gen Plant Frm: W Killmon
Office Mgr: R J Kennedy
JUDSON MINE, 1 mi S of Buhl, surface, Fe
Prod: 1,548 tons
JUDSON CRUSHING & SCREENING PLANT
MARISKA MINE, 1 mi NE of Gilbert surface, Fe
Prod: 3,000 tons
HEAVY MEDIA CONCENTRATOR
PILOT ANNEX MINE, 4 mi NE of Mt Iron, surface, Fe
MARGARET MINE, 1/2 mi W of Buhl, surface, Fe
ALICE, GRAFF, NORMAN, STUBLER, & YAWKEY MINES, surface, Fe

MORTON ORE CO
Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Mesabi Range, Fe
MORTON, SOUTH EDDY GROUP MINE, Stuntz Twp
Mine Supt L M Bredvold
Asst Mine Supt: John E Bemis
Mine Frm. M A England

OGLEBAY NORTON & CO
The Hanna Bldg, Cleveland, Ohio
NORTHERN OFFICE, 304 Christie Bldg, Duluth
VP: Frank J Smith
Ind Rel Dir H J Gemuenden
Elec Eng: W W Viebahn
Purch Agt. A J Windt
Mng Eng: A P Torreano
ST JAMES MINING CO, Aurora
Mgr. Oglebay Norton & Co
ST JAMES MINE, Aurora, surface, Fe
Supt: B L Knudson
Asst Supt: T H Trihey
Master Mech: Walter Williams
Ch Elec. Edward M Plattner
Prod: 1,000,000 tons iron ore yrly
(See Ohio)

PACIFIC ISLE MNG CO
2521 First Ave, Hibbing
Pres. Hugh H Harrison
VP & Gen Mgr. John D Boento, Jr
Treas. O J Keeler
Sec. E T Binger
Gen Supt Arne O Tuomala
Asst to Gen Mgr, Eng. H M Hart, Jr
Asst to Gen Mgr, Met: Donald C K Kimball
Mineral Devel Dept: G T Beardshear
Ch Eng A T Vellella
INCLUDES BRADFORD MINING COMPANY, CHATACO MINING COMPANY, COONS PACIFIC COMPANY, HOLLAND MINING COMPANY, PITTSBURGH PACIFIC COMPANY
MINES: BRADFORD, CHATACO, COMMODORE-JULIA, DREW-CROXTON-SYME, GRAHAM, HOLLAND, LAMBERTON, MEADOW-POWLER, MINORCA-LARKIN, MISSABE MOUNTAIN, MISSISSIPPI NO 1, NORTH SHIRAS, ST PAUL, SIDNEY, STEVENSON, UNO-KERR GROUP, WACOOTAH, WENTWORTH, open pit, Fe
PLANTS NORTH UNO CONCEN
Plant Superv. Jack Durham
COONS PACIFIC CONCEN
Plant Superv. Ralph Hurd
WENTWORTH CONCEN
ST PAUL WASHING PLANT
JULIA WASHING PLANT
(See Mich)

PHILBIN MNG CO
1300 Leader Bldg, Cleveland, Ohio
WEGGUM-SOUTH LONGYEAR GROUP
Box 739, Hibbing
Mgr of Minn Mines. B M Andreas
Asst Mgr of Minn Mines: R C Wallace
Gen Supt. R B Crist
Mech Eng: J P Vidmar
Elec Eng. F M Bohan
Purch Agt. G H Shields
MINES, surface, Fe
Mine Supt: L M Bredvold
WASH PLANT
Cap: 400 tons per hr

PICKANDS MATHER & CO
700 Sellwood Bldg, Duluth 2
Gen Mgr. A D Chisholm
Mgr of Eng: O L Vauch
Gen Mgr of Mines: E L Joppa
Oper Asst: A L Johnson
Ch Mech & Elec Eng: B W Bernstrom
Purch Agt: D A Brunesu
Supvr of Safety & Ind Rel: E A Amundsen
HIBBING DIST, Mesabi Range, Hibbing, Fe
Gen Supt: M L Bradt
Asst Gen Supt: R T Bell
Dist Mng Eng: R W Sullivan
Ch Clerk: W S Home
Dist Safety Supvr C E Hager
CRETE MINING CO, ALBANY MINE & WASHING PLANT, Hibbing, undergr
Supt: T R Tregemobo
HOYT MINING CO, SCRANTON MINE CRUSHING & WASHING PLANT, Hibbing, surface
Supt: E C Sponberg
MAHONING ORE & STEEL CO, MAHONING MINE, Crushing, Hibbing, surface
Supt: W D Webb
UTICA MNG CO, CARMI CARSON LAKE MINE & CRUSHING PLANT, Hibbing, surface
Supt: L T Long
BALKAN MNG CO, DANUBE MINE & BENEFICIATION PLANT, Bovey, surface
Supt: W L Thomte
WESTERN MINING CO, WEST HILL MINE & BENEFICIATION PLANT, Grand Rapids, surface
Asst Supt. J M Shields
TIOGA NO 1 MINE
Asst Supt A M Anderson
EAST MESABI DIST, BIWABIK
Gen Supt. T C Thielman
CORSICA IRON CO, CORSICA MINE & CRUSHING & WASHING PLANT, Elcor, surface
Gen Supt: T C Thielman
LAKE MNG CO, EMBARRASS MINE & CRUSHING PLANT, Biwabik, surface
Supt: G C Watts
ERIE MNG CO, TACONITE OPER, Aurora
Supt: R P Kohn
ELY DIST, Vermillion Range, Ely
Supt B S Richards
VERMILLION MNG CO, ZENITH MINE, Ely, undergr
Supt: B S Richards
CUYUNA DIST, Cuyuna Range, Crosby
Gen Supt: J P Schemmel
Dist Mng Eng: D W Carlton
Ch Clerk Matt Kayfes
CUYUNA ORE CO, MAHNOMEN MINE & CRUSHING PLANT, Crosby, surface
Supt H Stetson
SAGAMORE ORE MNG CO, SAGAMORE MINE, CRUSHING & DRYING PLANT, Riverton, surface
Supt H Stetson
YOUNGSTOWN MINES CORP
RABBIT LAKE MINE & CRUSHING PLANT, Crosby, surface
Supt. H Stetson
(See Mich, Wisc)

PIONEER MNG CO
Box W, Biwabik
Pres: Frank S Bergstrom
Ch of Bd: Patrick Butler
Sec. F J McArthur
Treas R J Flaeder
MARY ELLEN MINE, 1/2 mi W of Biwabik, surface, Fe
Mine Supt. H F Manseau, Jr
Mine Frm: Frank Press, Jr
Prod: 450,000 tons per year
MILL, Biwabik
Prod: 6,000 tons

PITTSBURGH PACIFIC CO
(See Pacific Isle Mng Co)

REPUBLIC STEEL CORP
Gen Off: Republic Bldg, Cleveland 1, Ohio
Dist Off: 204 Sellwood Bldg, Duluth
Dist Mgr. F H Cash
Acting Ch Mng Eng: S C Howell
Ch Mech & Elec Eng: I V Crego
SUSQUEHANNA MINE, Hibbing, surface
Supt: M C Woodle
Eng. S V Smith, Jr
(See Ala, Mich, N Y, Ohio)

RESERVE MNG CO
Silver Bay
Pres. W M Kelley
VP C L Kingsbury
VP, Chg of Oper. R J Linsley
Treas: J Wm Bryant
Sec: J J Dwyer
Asst Mgr of Oper. E C Lampman
Purch Agt: R J Woods
Dir Pub Rel: Edward Schmid
Dir Ind Rel: W L Edwards
Pelletizing Supt: K M Haley
Crushing & Concen Supt: E M Furness
PETER MITCHELL TACONITE MINE, Babbitt, surface, taconite
Mgr, Babbitt Div: Floyd W Erickson
Mine Supt: F E McIntire
Prod: 42,000 tons taconite rock daily
BABBITT PLANT, magnetic separation
Prod: 1,000 tons iron ore pellets daily
SILVER BAY PLANT, E. W. Davis Works, Silver Bay, magnetic separation
Prod: 12,000 tons iron ore pellets daily
(See Ohio)

RHUDE & FRYBERGER
Box 779, Hibbing
Part: J O Rhude, R M Fryberger
TROY MINE, Eveleth Mesabi Range, surface, Fe
DOEING MINE, Hibbing, Mesabi Range, surface, Fe, Wash Pl
PENNINGTON MINE, Ironton, Cuyuna Range, surface, Fe
CARLSON-NELSON MINE
HILLCREST STOCKPILE, Cuyuna Range, surface, Fe
HMS PLANT

ST JAMES MNG CO
(See Oglebay Norton & Co)

SKUBIC BROS CO
705 6th Ave N, Virginia
Pres. Tony Skubic
VP & Purch Agt: Edward Skubic
Sec-Treas: Frank Skubic
VIRGINIA MINE, Eveleth, 3 mi S Virginia, surface, Fe
Gen Supt: Frank Skubic
Mine Frm: Luther Swanson
Elec Eng: Carl Sulentick
Idle
3,000-TON HMS, Jigs
Mill Frm: Joe Spaler

SNYDER MNG CO
1101 Alworth Bldg, Duluth 2.
VP & Gen Mgr: A L Fairley, Jr
Gen Supt: C O Rudstrom
Ch Eng: A C Borgeson
Ch Chem: A W Johnson
Mech Supt: E F Eidam
Comptroller: V O Youngdahl
Purch Agt: C J Hathaway
Elec Eng: O E Larson
Gen Maint Frm: J Zobitz
WEBB MINE, Hibbing, open pit, Fe
Mine Supt: J J Maney
Gen Mine Frm: A E DesRosier
Asst Gen Mine Frm: J J Munter
Res Eng: E Zobitz
Prod: 5,000 tons per day
4,000-TON GRAV MILL
Mill Frm: A E Erickson
WHITESIDE MINE, Buhl, open pit, Fe
Mine Supt: R M Baker
Asst Mine Supt: T J Barker
Gen Mine Frm: A Stukel
Res Eng: D C Swaim
20,000-TON GRAV MILL
Mill Frm: F C Hodge
(See Pa)

SOUTH AGNEW MNG CO
Hibbing
Mgr of Minn Mines: B M Andreas
MINES, Mesabi Range, Fe
SOUTH AGNEW, AGNEW NO 2 GROUP MINE, Stuntz Twp
Mine Supt: L M Bredvold
Asst Mine Supt: John E Bemis
(See Ohio)

U S STEEL CORP, OLIVER IRON MNG DIV
Wolvin Bldg, Duluth 2
Pres. R T Eisted
VP-Oper: W N Matheson
Asst to VP-Oper: L S Campbell, W E Cotter, Jr.
VP-Administrative: R O Hawkinson
VP-Mng Division: L J Severson
Asst Sec: H P Clarke
Treas: R L Larson
Comptroller: R B Henley
Mgr Mng Eng: R A Moberg
Mgr Geol Investigation: R W Marsden
Mgr Beneficiation: A T Koenen
Mgr Research: R J Morton
Mgr, Indust Eng: Q T Martin
Superv Ore Movement: F J Perry
Ch Eng: C N Bailey
Dir, Ind Rel: J S Bonte
Purch Agt: G A Engel
Ch Grader: G H Sharbach
EASTERN DISTRICT, Virginia
Gen Supt: John Chisholm
Asst Gen Supt: J M Johnson, M V Mierke
Supt of Maint: J A Vitzthum
Asst Supt of Maint: C A Lindberg, C R Peterson, W A Hyde
Ch Mng Eng: J T Nolan
Ch Chem: I R Lerohl
CANTON MINE, Mesabi Range, surface, Fe
Supt: D Hartley
EVELETH MINE, Mesabi Range,

surface, Fe
Supt: K H McInnis
Asst Supt: E J E Olson
MOUNTAIN IRON MINE & PILOTAC MINE, Mesabi Range, surface, Fe
Supt: I H Rubow
ROUCHLEAU MINE, Mesabi Range, surface, Fe
Supt: E V Nelson
Asst Supt: L E McKenzie
PIONEER MINE, Vermilion Range, undergr, Fe
Supt: L E Dick
SCUDAN MINE, Vermilion Range undergr, Fe
Supt: E M Holmes
ETACA PLANT, Mesabi Range, agglomerating
Asst Supt: C W Niemi
HIBBING-CHISHOLM DISTRICT, Hibbing
Gen Supt: J H Hearding, Jr
Asst Gen Supt: N G Holland
Supt of Maint: J R Schoenig
Asst Supt of Maint: K L Prothero
Ch Mng Eng: M R Sermon
Ch Chemist: W E Holliday
HULL RUST MINE, Mesabi Range, surface, Fe
Supt: E C Silver
Asst Supt: W J McGuire
HULL RUST CONCENTRATOR
Supt: E C Silver
Asst Supt: W J McGuire
SHERMAN MINE, Mesabi Range, surface, Fe
Supt: M J Forsmark
Asst Supt: M D VanDelinder
PILLSBURY MINE, Mesabi Range, surface, Fe
Supt: H M Pickering
MONROE MINE, Mesabi Range, surface, Fe
Supt: W W Beebe
Asst Supt: E M Gilmore
FRASER MINE, Mesabi Range, undergr, Fe
Supt: A C Solem
CANISTEO DISTRICT, Coleraine
Gen Supt: E A Friedman
Asst Gen Supt: M E Johnson
Supt of Maint: A C Prisk
Asst Supt of Maint: R N McIndoo
Ch Mng Eng: L E Battles
Ch Chem: E R Bechtel, Jr
ARCTURUS MINE, Mesabi Range, surface, Fe
Supt: H F Bolton
KING MINE, Mesabi Range, surface, Fe
Supt: J H Harrison
Asst Supt: L Scipioni
PLUMMER MINE, Mesabi Range, surface, Fe
Supt: A F Savage
TROUT LAKE CONCENTRATOR, Mesabi Range
Asst Supt: V V Ahola
PLUMMER CONCENTRATOR, Mesabi Range
Gen Plant Frm: W L Zeiher
ARCTURUS CONCENTRATOR
Asst Supt: T O Olsen
(See Alaska, Ala, Calif, Pa, Tenn, Utah, Wyo)

YOUNG, E A INC
2323 First Ave, Hibbing
Pres: E A Young
VP & Supt: Nels Kemppainen
Sec: D D Haley
MINNEWAS MINE, P O Box 118, Virginia, 2 mi E of Virginia, Mesabi Range, surface & undergr, Fe
Frm: A H Hetkhila
(See Haley-Young Mng Co, Minn)

ZONTELLI BROS, INC
Ironton
Pres: Emil Zontelli
VP: Henry Zontelli
Sec-Treas: Anne V Stang
Gen Mgr: N E Hill
Gen Supt: Henry Zontelli
Met: John Simone
Geol: Elton LaSart
Mech Eng: Francis Chase
Elec Eng: Dan Doshan
Purch Agt: Ernest Kutsner
VIRGINIA MINE, N of Ironton, Cuyuna Range, surface, Fe
4,000-TON VIRGINIA PLANT
TROMMALD
MINNESOTA MINES
GRAHAM NO 1 MINE, Mesabi Twp, Mesabi Range, surface, Fe
MANGAN-JOAN MINE, Irondale, Cuyuna Range, surface, Fe
MERRITT LEAN ORE STOCKPILE, Trommald, Cuyuna Range
MANUEL MINE, Crosby, Cuyuna Range, surface, Fe
2,500-TON MANUEL PLANT, Crosby
(See Minn)

MISSISSIPPI

AMERICAN COLLOID CO
Merchandise Mart Plaza
Chicago 54, Ill
ABERDEEN MINE, surface, bentonite, Aberdeen
Supt: Edward G Birkholz
Prod: 150 tons
ABERDEEN MILL
Cap: 250 tons
WHITE SPRINGS MINE, surface, bentonite, White Springs (P O at Aberdeen)
Supt: Edward G Birkholz
Prod: 150 tons
(See Ill, S Dak, Wyo)

INTERNAT'L MINERALS & CHEMICAL CORP
Smithville (P O Amory)
Mgr: Ivan Greene
Supt: Maurice Clay
SOUTHERN BENTONITE MINE
(See Ariz, Colo, Fla, Ill, Me, N Mex, N C, Ohio Tenn, Va, Wyo)

MISSOURI

ALLIED CHEM & DYE CORP GEN CHEM DIV
Gwenzville
MISSOURI CLAY FIELDS
Supt: R A Parker
(See Colo, N Y, Va)

AMERICAN ZINC LEAD & SMELTING CO
1515 Paul Brown Bldg, St Louis
Pres: H I Young
VP: Eric V Daveler, Thornton Emmons, Alwin C Eide, Richard A Young, Howard L Young
VP & Treas: W J Matthews, Jr
VP & Cont: C V Burns
VP, Chg Traffic: Neal S Worrell
Sec & Ch Counsel: R C Perkins
Asst Sec & Asst Treas: R K Wall
Asst to Pres: D I Hayes
Purch Agt: C T Millice
(See Ariz, Ill, Miss, Ohio Tenn, Tex, Wash, Wisc)

CARTER, J E MINING CO
Potosi
Pres & Gen Supt: Geo L Carter
VP: Wm Carter
Sec: G F Cresswell
MNG OPER, Wash County, surface, barite

DALE MINING CO
811 Kentland, Neosho
Part: D P & G E Klepinger & J A Worley
MINES, DUNGY, SHINN, ROBISON, PATTERSON, Stark City & Aroma, undergr, Pb, Zn
Idle
600-TON GRAV-FLOT MILL, Stark City

DeSOTO MINING CO
326 S Main St, DeSoto
MINE, surface, barite

FEDERAL MNG & SMELTING CO
(Wholly-owned subsid of Amer Smelting & Refining Co)
DUTENWEG MINE, Jasper, Pb, Zn
Idle

JOSIE K FOLSOM MNG & MLG CO, LTD
4300-A Holly Ave, St Louis
Pres: Dr C R Curran
VP: L A Lambert
Sec-Treas: Fred W Kublis
Directors: Oscar F Huegel, Celeste Becker Skinner
MINES, Saguache County, Colo
(See Colo)

GENERAL BARITE CO
Desoto
MINE, Desoto, barite

HORNSEY BROS
P O Box 308, Potosi
MINE, 1 mi S of Potosi, Wash County, open pit, barite
Mine Frm: H R Hale, Rosie Blair
100-TON GRAV MILL

HOWELL MINING CO
Mineral Point
MINES, Wash County, barite

KNOX-ARIZONA COPPER MNG CORP
8967 Ladue Rd, St Louis 24
(See Ariz)

MIDWEST MNG CO
Box 87, Potosi
MINE, Potosi, barite

MINE LA MOTTE CORP
(Subsid of St Joseph Lead Corp)
250 Park Ave, N Y 17, N Y
Pres: Andrew Fletcher
VP: C M Chapin, Jr
Sec: R H Ramsey
MINE LA MOTTE, undergr, surface, Pb, Bonne Terre
Div Mgr: E A Jones
Div Supt: F P Redfield
Prod: 2,000 tons
2,000-TON FLOT-GRAV MILL, Fredericktown

MINERVA OIL CO, FLUORSPAR DIV
320 N 4th St., St Louis
Pres: Joe Desloge
VP: Joe Desloge, Jr
Sec. Berkley Jones
Off Mgr: V Rembold
(See Ill)

MONSANTO CHEM CO
1700 S Second St, St Louis 4
Ch of Bd: Edgar M Queeny
Pres: Charles Allen Thomas
INORGANIC DIV
Gen Mgr: J L Christian
Div Eng: W T Durrett
MINES & PLANT, Monsanto, Tenn, elemental phosphorus
Plant Mgr: Edward J Bock
(See Idaho, Tenn)

NATIONAL LEAD CO, BAROID DIVISION
FOUNTAIN FARM, Potosi, surface, barite
WET GRIND MILL
Supt: E L H Sackett
(See Ark, Calif, Kans, La, Mont, Nev, N Y, Tenn, Tex, Wyo)

NATIONAL LEAD CO, ST LOUIS SMELTING & REFINING DIV
Box 351, Fredericktown
Mgr: Harold A Krueger
Asst to Mgr: J A Rood
Comptroller: R J Burhard
MADISON MINE, Fredericktown, undergr, Pb, Cu, Ni, Co
Gen Supt: J E Phebus
Mine Supt: F H Hurst
Geol & Eng: R P Uhley
Prod: 1,400 tons
1,400-TON FLOT MILL
Mill Supt: A W Lanhenos
Asst Mill Supt: Paul Smith
REFINERY, Fredericktown
Mgr: W R McCormick
Supt. G E Peters
Under devel
(See Ark, Calif, Kans, La, Mont, Nev, N Y, Tenn, Tex, Wyo)

OZARK ORE CO
Iron Mountain
IRON MOUNTAIN MINE, undergr, iron ore
Gen Supt: F H Lee
Geol: John Murphy
Mine Frm. Bruno Scottis
Mine Eng: R Pilliard
Master Mech. Henry Gration
Chief Elec: Vic Calliste
2,000-TON GRAV MILL
Mill Supt: A E Cameron
Assay: R B Key
(See N A Hanna Co & Ozark Ore, Ohio)

POTTER SIMS MINES INC
Box 298, Joplin
Pres: Geo W Potter
VP & Gen Mgr: D S Sims
Gen Supt: Leonard Parker
Mine Supt: Jack Belding
Asst Mine Supt: John Skinner
Mine Frm: Geo T Brown
SUCKER FLAT MINE, Webb City
WESTSIDE MINE, 1/2 mi S of Alba
open pit, Pb, Zn
2,500-TON FLOT-GRAV MILL, Webb City
Mill Supt: Floyd C Cain

ST JOSEPH LEAD CO
250 Park Ave, N Y 17, N Y
Pres: Andrew Fletcher
VPs: C M Chapin, Jr, Francis Cameron, R J Mechin
VP-Treas: George I Brigden
VP & Sales Mgr: Charles R Ince
SOUTHEAST MISSOURI MNG & MLG DIV, Box 32, Bonne Terre, undergr, Pb Zn
Div Mgr: Elmer A Jones
Ch Geol: John S Brown
Gen Mech Supt: B L Beal
Div Supt, Indian Cr Mine & Mill: L W Casteel
Gen Mine Supt: L L Turley
Asst Gen Mine Supt: C B Davis, B T Wyhoff
Prod: 23,000 tons
5-FLOT-GRAV MILLS
Gen Mill Supt: T J Clifford
Mill Supt: H A Hoffman, H R Stahl, M N Dunlap, K B Hall
Asst Mill Supt: E J Krokroskia
Cap: 24,000 tons
BLAST FURNACE, Herculaneum
Div Mgr: W T Isbell
Cap: 100,000 tons lead yrly
(See N Y, Pa, & Mine La Motte Corp, Mo)

SHENANDOAH-DIVES MNG CO
616 Finance Bldg, Kansas City
Pres: J W Oldham
(See Colo)

SHOOK & FLETCHER SUPPLY CO
West Plains
KINGS BURY MINE, open pit, Fe
Gen Mgr. E H Craddock
Mine Supt. Robert Wilson
(See Ala)

SUPERBAR CO
Potosi
Pres. Geo L Carter
VP: G F Cresswell
Sec Floyd Carter
Gen Supt: Russell Degonia
GRINDING MILL, Mineral Point

TERRACE MINING CO
Potosi
Pres & Gen Mgr. Dall B Groves
VP: Julia E Floyd
Sec. Robert D Evans
TERRACE MINE 9 mi N Potosi, surface, barite
Mine Frm: Harry D Patterson
Prod: 50 tons
75-TON GRAV MILL
Mill Frm: Harry D Patterson

TRIPLE "O" URANIUM MNG CO
Moberly
(See Colo)

UTLEY, A T
P O Box 391, Cape Girardeau
NEWER MINE, Oregon County open pit, Fe
Mine Supt: A T Utley
Mine Frm: Cecil Weldon
Prod: 150 tons

WHALEY & SCOTT MNG CO, INC
Mineral Point
MINE & MILL, Wash County, barite

WOLF, H A
Cadet
MINE & MILL, Wash County, surface barite

MONTANA

AMAZON MNG CO
Box 372, Coeur d'Alene, Idaho
Pres: A E Lundon
Sec-Treas: Geo M Servick
MINE, near Heron, Au, Ag, Cu
Mont Agt: Joe Brooks, Noxon
Under devel
(See Idaho)

AMERICAN CHROME COMPANY
1 Montgomery St, San Francisco 4 California
Pres: Willis A Swan
VP & Gen Mgr: John Bley
Sec. Geo M Spradling
Treas: John L Lukens
Purch Agt: D W Graves
MOUAT MINE, Nye undergr, chrome conc
Geol: E S Rugg
Prod: 1,000 tons
1,000-TON FLOT MILL, Nye

AMERICAN MACHINE & METALS, INC, TROUT MNG DIV
233 Broadway, New York 7, N Y
Pres: C W Anderson
Sec: Alphonse Kenison
Treas: Robert G Burns
TROUT-ALGONQUIN GROUP, Philipsburg, 2 mi E of Philipsburg, undergr, Ag, Zn, Pb, MnO
Gen Mgr: Roy McLeod
Asst Gen Mgr: Roy Hamilton
Geol: Daniel Meschier
Mine Supt: Thomas Purtell
Prod: 175 tons
175-TON GRAV MILL
Mill Supt: Thomas Purtell
Mill Frm: Kenneth Bauer
(See N Y)

AMERICAN SMELTING & REFINING CO
JACK WAITE MINE, Sanders County
Pb, Zn (See Idaho)
Supt: C H Blackwell
EAST HELENA PLANT, East Helena, Custom Lead Smelter
Mgr: Joseph T Roy
Supt: Stanley M Lane
Asst Supt: Ernest A Hase
Ch Acct: C G DeGooyer
Purch Agt: F C Casey
Pl Eng: Lyle F Clow
Prod: 60,000 tons of Pb bullion yrly
(See Ariz, Calif, Colo, Idaho, Ill, Kans, Md, Neb, N J, N Mex, N Y, Tex, Utah, Wash & Federal Mng & Smelting Co, Mo)

ANACONDA ALUMINUM CO
Columbia Falls
Pres R B Caples
VP: C H Steele
Sec-Treas: C E Moran
Purch Agt: A B Harris
Gen Supt: J F Smith
REDUC PLANT, Columbia Falls, Al
Mgr: H G Satterthwaite
Scheduled prod: 130,000,000 lbs

ANACONDA CO, THE
Butte
VP, Chg West Oper: C H Steele
Gen West Counsel: J T Finlen
Gen Mgr, West Mng Oper: A C Bigley
Asst to VP: F A Linforth
Asst to VP: J H Dickey, Jr
Asst Sec-Treas: D K Nelson
Asst Sec: J D Murphy
Mgr of Mines: E I Roncoard, Jr
Gen Supt of Mines: A R Sims
Asst Ch Geol, North America: M H Gidel
Charge, Geol Dept, Butte, E P Shea
Ch Mng Eng: Fred Strandberg
Ch Sampler: P K Ramsey
Eng Research Eng: L F Bishop
Ch Mech & Elec Eng: C J Lundberg
Mech Supt: F C Jaccard
Asst Mech Supt: George Lilly
Elec Supt: I H Stock
Chmn, Bureau of Safety: H A Wendel
Ch Ventil Eng: J W Warren
Labor Commissioner: Eugene Hogan
Asst Traffic Mgr: W L Kennedy
Ch Assayer: W C Gallagher, Jr
Supt, Washoe Sampler: Dennis E Leary
Frm: Fire Filling Dept & Diamond Drilling: J K Ballard
Frm, Precip Pl: J P Ryan
Block Cave Mng Eng: R C Corbett
Asst Gen Supt, Kelley, Berkeley Pit & Emma Mines: Martin Hannifan
Asst Gen Supt, Mt Con, Steward & Original Mines: W R Russert
Asst Gen Supt, Charge of Leonard & filling operations for Greater Butte Project (Kelley Mine): Hale Strock
Asst Gen Supt, Badger, Lexington & Alice Mines & High Ore Pumping Pl: Ed Bonner
Asst Gen Supt, Anselmo, Orphan Girl & Belmont Mines: V D O'Leary
ALICE MINE, Butte dist, undergr, Zn
Asst Gen Supt: Ed Bonner
ANSELMO MINE, Butte dist, undergr, Zn
Asst Gen Supt: V D O'Leary
Mine Supt: Sam Heatherly
BADGER MINE, Butte dist, undergr, Zn
Asst Gen Supt: Ed Bonner
Frm: Steve Hurley
BELMONT MINE, Butte dist, undergr Cu
Asst Gen Supt: V D O'Leary
Frm: John Kolesar
BERKELEY OPEN PIT COPPER MINE, open pit, Cu
Asst Gen Supt: Martin Hannifan
Supt: G W Parker
Frm: E E Norris
Mng Eng: J J Dougherty
EMMA MINE, Butte dist, undergr, Mn
Asst Gen Supt: Martin Hannifan
Frm: William Kerruish
HIGH ORE PUMPING PLANT, Butte dist,
Asst Gen Supt: Ed Bonner
Frm: Joe Canavan
KELLEY MINE, GREATER BUTTE PROJECT, Butte dist, open pit, Cu
Asst Gen Supt: Martin Hannifan
Asst Gen Supt, Filling oper: Hale Strock
Mine Supt: John Killoy
LEONARD MINE, Butte dist, undergr Cu
Asst Gen Supt: Hale Strock
Mine Supt: Russell Powell
LEXINGTON MINE, Butte dist, undergr, Zn
Asst Gen Supt: Ed Bonner
Mine Supt: Dan Griffin

MT. CON MINE, Butte dist, Cu
Asst Gen Supt: W R Russert
Mine Supt: John Sutie
ORIGINAL MINE, Butte dist, Cu
Asst Gen Supt: W R Russert
ORPHAN GIRL MINE, Butte dist, undergr, Zn
Asst Gen Supt: V D O'Leary
Frm: Herman Gillin
STEWARD MINE, Butte dist, undergr, Cu
Asst Gen Supt: W R Russert
TRAVONA MINE, Butte dist, undergr, Zn

ANACONDA REDUCTION WORKS
Anaconda
Mgr: W A Emanuel
Gen Supt: F H Day
Asst Gen Supt: J R Moore
Project & Devel Eng: C M Holstrom
Supt, Employee Relations: C P Milkwick
Supt, Concentration: F A Roeder & J L Bolles
Supt, Smelting: E S Kramlick
Supt, Converting & Casting: A C Bigley
Supt, Sponge Iron Pl: R Dugdale
Supt, Electrolytic Zinc Pl: F A Salmonson
Supt, Roasters: H M Mease
Supt, Electrolyzing & Casting: K O Sweney
Supt, Acid & Phosphate Pl: K F Huckwardt
Supt, Manganese Nodulizing Pl: E O Strummen
Supt, Ferromanganese Pl: J T O'Donnell
Research Eng & Dir of Met Research: F L Holderreed
Asst Research Eng: R E Sullivan
Testing Eng: T G Pulmor
Met: J H McCrea
Ch Chemist: E N Boyce
Mech Supt: L E Larsen
Supt of Construction: H F Merrie
Ch Draftsman: E P Dimock
Supt, Slag & Tailings: J A Grant
Supt, Tram: I G Gnose
Supt, Surface: J F Sladick
Supt, Repair Foundry: H M Hansen
Ch Clerk: W D Martin
COPPER CONCEN, 28,000 tons per day
ZINC CONCEN, 4,000 tons per day
MONGANESE CONCEN, 1,500 tons per day
COPPER SMELTER, 150,000 tons per year
ELECTROLYTIC ZINC PLANT, 86,400 tons per year
SULPHURIC ACID PLANT, 600 tons 66° Bume acid per day
TREBLE SUPERPHOSPHATE PLANT, 100,000 tons per year
MANGANESE NODULIZING PLANT, 415 S D T per day
FERROMANGANESE PLANT, 3,250 S D T per month
ARSENIC PLANT, 1,000 tons white arsenic per month
GREAT FALLS REDUCTION WORKS
Great Falls
Mgr: F S Weimer
Asst Gen Supt: L J Ingvalson
Mech Supt: J W Porter
Met: R J Lapoe
Ch Clerk: W P Beddon
EAST HELENA SLAG PLANT
Supt: R L Thompson
Asst Supt: A B Kane
ELECTRIC FERROMANGANESE FURNACE, 670 S D T per month
ELECTROLYTIC & FURNACE COPPER REFINERIES, 144,000 & 150,000 tons per year
Supt: R H Miller
Asst Supt: S R Westgard
ELECTROLYTIC ZINC REFINERY, 159,000 tons per year
Supt: G T Wever
Asst Supt: R B Balthiser
(See Calif, Idaho, Nev, N Mex, N Y, Utah)

ANTONIOLI, PETER & PETER, JR
524 S Washington St, Butte
BURLINGTON MINE, Silver Bow, Mn
PHOSPHATE MINE, Highland dist, phosphate rock
Under devel
TZARINA MINE, Butte dist, Mn, Zn
WHITEHALL MINE, Whitehall Dist, Jefferson County, Au, Ag, Pb, Zn
Idle

BARABI MNG CO
c/o R E Johnson, Sheridan
W B McDonald, Belgrade
Dr R B Farnsworth, Bozeman
MINE, Virginia City dist, Au
Under devel

BASIN-JIB MINES LTD
100 Adelaide St, Toronto 1 Ontario
Pres: Denison Denny
VP: J G Pierdon
Sec: Margaret B Smith
Treas: J D Hague
BASIN JIB MINES, Basin, Box 406, Boulder, undergr, Au, Ag, Pb
Supt: W E Field
Under devel

BEAVERTAIL MNG CO
Box 9887, Townsend
SLIM JIM-MILLER MINE, Broadwater County, Au, Ag

BENNETT MNG CO
Box 1135, Great Falls
Pres: Carroll R Bennett
Sec: F A Clarke
DACOTAH MINE, 1 1/2 mi N of Neihart, undergr, Za, Pb, Ag, Au
Idle
60-TON FLOT MILL, 1 mi from Neihart

BLACK & WHITE MNG CO
331 N Ave W, Missoula
Pres & Gen Mgr: Roger F Little
BROOKLYN MINE, Marville, 4 mi N of Philipsburg, undergr & surface, Ag, Pb, Zn, Cu
Under devel
D-G MINE, Marville, Ag, Pb, Cu, Au, Bi, U_3O_8
Under devel
(Leased from George Creesenbergh, Robert A Little, & Robert F Little)

BLUE DOT MNG CO
Dillion
NEW DEPARTURE MINE, Blue Wing Area, SW of Dillon, Ag, Cu, Pb

BOSS MINES, INC
Helena
Pres C L Hewitt
MINE, Cascade City, Pb, Zn
Under devel

BULLWACKER MINE
Box 1719, Helena
Opr: Norman Rogers
BULLWHACKER MINE, E of Butte, open pit
Idle
BERTHA MINE, E of Butte, open pit
Idle
MIKE HORSE MINE, Lincoln, undergr, Pb, Cu, Ag

BULS MINING CO
1051 E Broadway, Missoula
Gen Mgr: C F Buls
Asst Mgr: Don Ralston
Sec: Wm Buckley
BLACK TRAVERAL, 6 mi NE of Saltese, undergr, Ag, Cu, Au
Idle
ST LAWRENCE MINE, Saltese, Ag, Cu, Idle

BUTLER, E DEAN
606 Rood Ave, Grand Junction, Colo
PLACER, Elk Creek near Greenough, Au
Under devel

BUTTE COPPER & ZINC CO
25 Broad St, New York 4
Pres: A A Sheiare
VP & Treas: Miles MacDonald
Sec: John F Cole
EMMA MINE, 203 Lewisohn Bldg, Butte, undergr, Mn, Zn, Ag, Pb, Au
Res Eng: Samuel Barker, Jr
Prod: 1,100 tons
(Operated by Anaconda Copper Mng Co)

BUTTE MINES MERGER CORP
2711 Harvard Ave, Butte
MINNE JANE MINE, 1 mi W of Butte, Silver Bow County, Mn

CANYON LODE MNG CO
219 Radio Central Bldg, Missoula
Pres R R Wallace
VP: Roy Wallace
Sec: Herbert C Fisher
Geol: Earl F Elstone
CABLE MINE, Anaconda, 15 mi NW of Anaconda, undergr & placer, Au, Cu
Idle
100-TON FLOT MILL
Idle

CHARTER OAK MNG CO
Box 506, Elliston
CHARTER OAK MINE, Elliston, 5 mi S of Elliston, undergr, Pb, Ag, Au, Zn
Gen Mgr: J T Bonner
Under devel
50-TON FLOT MILL, at mine

COLOTAH URANIUM CORP
1115 Midland Bank Bldg, Billings
Mgr: S P Kurth
SNAIL CLAIMS, U_3O_8

COMMONWEALTH LEAD MNG CO
434 Felt Bldg, Salt Lake City, Utah
CALVIN MINE, Melrose, undergr, Au, Ag, Pb, Zn
Under devel
(Leased to Elaine Jensen)
(See Utah)

CONDOR MNG & LEASING CO
c/o Joe Powers, Drawer B, Troy
PLACER, on Callahan Cr, 3 mi S of Troy
Under devel

CONFEDERATE MNG CORP
Box 566, Townsend
PATENT 2650 MINE, Broadwater County, Au, Ag

CONSOLATION MINE
Lincoln
Oprs: Earl Neece & Tillotson Bros
MINE, Heddleston dist, Lewis & Clark Co, Ag, Pb, Zn
Under devel

CONTACT MINING CO
524 Washington St, Butte
Pres: Peter Antonioli, Sr
Gen Mgr: Peter Antonioli, Jr
Met: Frank M Antonioli
SCRATCH ALL MINE, Philipsburg, undergr, Ag, Zn, Mn, Pb
HIGHLAND PHOSPHATE MINE, Butte, 15 mi S of Butte, undergr & surface, phosphate
Under devel

COPPEROPOLIS MINE
Opr: George Gormley & Sons
807 S Main St, Butte
MINE, 23 mi E of White Sulphur Spr, Cu
Idle

COPPER QUEEN MNG CO
Drummond
Pres & Purch Agt: J H Motion
Sec: G D Lyon
MINE, Au, Cu, WO_3
Under devel

CORNUCOPIA MINES CO
Box 314, Virginia City
Mgr: Henry Beute
MINE, Virginia City, dist Madison County, undergr, Au, Ag
Idle

CRUMB, RAY W
Avon
HUMBINGER MINE, 31 mi N of Avon, undergr, Au Ag
Under devel
1-TON GRAV MILL
Under devel

CUMMINGS-ROBERTS
VH N Highland Ave, Los Angeles 38, California
Gen Part: H Evan Roberts
CRYSTAL MT MINE, Darby, open pit, CaF_2
Gen Supt: John W Taber
Prod: 300 tons
SIZING MILL
Mill Supt: Gordon Blackburn
Assayer: William Bickel

DENNY, EARL
Butte
MINE, Highland dist, S of Butte, WO_3
Under devel

DOMESTIC MANGANESE & DEVEL CO
Box 117, Butte
Pres & Purch Agt: J H Cole
VP: S A Pumpelly
Sec-Treas: Cathryn C Keith
400-TON FLOT MILL with nodulizing kil for rhodocrosite, oxide
Idle

DRUMLUMMON LEASE, INC
Marysville
MINE, Empire Section of old Drumlummon Mine, Au, Ag

EAST PACIFIC MINE
Winston
Op: H W Carver
MINE, 6 mi SW of Winston, Ag, Pb, Zn
Under devel

EBERLINE, L M
Dillon
WADHAMS MINE, Bannock dist, Beaverhead Cty, Ag, Cu, Pb, Zn

ELKHORN MNG CO
Boulder Bank Bldg, Boulder
Pres, Gen Mgr & Purch Agt: Wade V Lewis
VP: Hugh S Cannon

Sec-Treas: J T Lewis
ELKHORN & FREE ENTERPRISE MINES, Elkhorn & Boulder, undergr
Under devel
Geol & Mine Eng: Wade V Lewis
WILSON-ELKHORN MINE, 3 mi E of Clancy, undergr

ELLISTON CONSOL MNG CO
Elliston
LILLY, SURE THING, JULIA & COPPER KING GROUPS, 30 mi S of Elliston on Telegraph Cr, Au, Ag, Pb, Zn, Cu
Under devel

EVERGREEN MINE
Opr: A T Cooper
Box 963, Helena
MINE, Rimini dist, Lewis & Clark County, Ag, Au, Pb, Zn

FAITH MNG CO
Box 78, Monarch
VP & Gen Mgr: T J Vaughn-Rhys
Sec: Blanche Mayo
LIBERTY MINE, Barker mng dist, Ag, Au, Pb, Zn
Under devel

FERDINAND MINE
Argenta
MINE, Argenta Dist, Beaverhead County, Ag, Cu, Pb, Zn

FORMINCO, INC
c/o Al Dunco, Townsend
MARIETTA MINES, 17 mi NW of Townsend in Part dist, Au, Ag, Pb, Zn

FRENCH CREEK MNG CO
Argenta
SHAFER GROUP & LAST CHANCE MINE, Argenta, Au, Ag

GARRISON MNG CO
Virginia City
GARRISON MINE, 8 mi S of Virginia City, undergr, Au Ag
Under devel

GOLDEN ANCHOR MNG & MLG CO CONS, INC
1429 Old Nat'l Bank Bldg, Spokane, Wash
Pres, Purch Agt & Gen Mgr: H L Newmiller
VP: Loren Logsdon
Sec-Treas: Helen H Newmiller
BIG DICK, BLACKJACK, & ASSOC PROP, Box 535, Elliston
10 mi S & E of Elliston, undergr, Pb, Ag, Au, Zn
Mine Supt: H L Newmiller
50-TON CONCENTRATOR
Under devel

GRANT-JOHNSON MINE
257 Second Ave NE, Kalispell
MINE, 30 mi W of Kalispell, undergr & open pit, Au, Ag, Cu, Zn
Mgr: Dan J Grant
Geol: Donald Lindgren
Under devel

GRAY EAGLE MINE
Owners: R H Mills, Spokane, Wash
Frank Roe, Basin
MINE, 8 mi N of Basin, U_3O_8, Ag, Au, Pb
Idle

HALF MOON MNG CO, INC
308 Midland Bank Bldg, Billings
Pres: Charles I Kolstad
VP: R N Lotz
Sec-Treas: William G Mount
BIG TIMBER CREEK MINE, undergr, Pb, Ag, Au
Gen Mgrs: Charles I Kolstad & Wm G Mount
Under devel

HAND MINE
Argenta
Own & Oper: John Hand, Dillon
MINE, Ag, Au, Pb
Mine Supt: Bill Hand, Dillon
Under Devel (Prod two cars weekly)
IRON MT CLAIMS, adjoining mine
Own: John & Bill Hand

HARD LUCK MINES
Elliston
MINE, Ontario Cr, near Elliston
Under devel

HELENA-EDITH MINE
c/o H M & B G Kleinschmidt
Lincoln
MINE, Lincoln, Cu, Fe
Under devel

HERR, F E
Box 368, Dillon
CHARTER OAK MINE, Blue Wind dist, Beaverhead City, Ag, Pb

HIAWATHA MINE
Drawer R, Troy
MINE, near Troy, Pg, Ag, Zn
Under devel

HOBBY HORSE MINE
c/o R M Bielenberg, Deer Lodge
MINE, Ogden Mt dist, 6 mi E of Helmville, undergr, Au, Ag, Pb, WO_3
Gen Mgr R M Bielenberg
Under devel

HOKANSON BROS
Box 34, Norris
Gen Mgr: A E Hokanson
Asst Gen Mgr: F W Hokanson
PEARL GROUP, 7 mi SW of Norris, undergr, Au, Ag, Pb,
Under devel

HUGHES CREEK MINE
c/o Asbury Smith, Hamilton
Oper. Asbury Smith
MINE, Overwich dist, Ravalli County placer, Au, Sn

HUNT MNG CO, INC
Box 65, Laurin
Pres M Z Hunt
Gen Mgr. A E Hunt
BINS, GOLD NUGGET, BULL RUN & CALIFORNIA GROUPS, Laurin, undergr, surface & placer, Au, Ag, Pb
Frm: Toney Ravona
Mech Eng: Elbert Pack
Idle
GRAV-FLOT MILL
Frm: Karl Caldwell

HYPOTHEEK MNG & MLG CO
510 Bank St, Wallace, Idaho
CLAIMS, Ravelli County, U_3O_8
(See Idaho, Utah, Wash)

INSPIRATION LEAD CO, INC
Spokane, Wash
MINE, Ore Groups, Yaak dist near Troy, Pb

JANUARY MINING CO
414 Fleuerss St, Helena
Pres: Gen G E Neil
JANUARY MINE, 6 mi S of Winston, undergr, Pb, Ag, Au
Mine Supt. Arthur Hogan
Prod: 700 tons
(Leased to January Mines, c/o Ed Pehl, 106 Harvard N, Seattle, Wash)

JUPITER MINING CO
Box 1010, Wallace
Pres: H L Day
Sec: R W Anno
MINE, near Saltese, undergr, Pb, Ag, Cu
Idle

LAHEY LEASING CO
506 W Aluminum St, Butte
ATLA MINE, Colorado dist, Jefferson County, Au, Ag, Cu, Pb, Zn

LEHMAN, WALTER
803 W Main St, Lewiston
SIR WALTER SCOTT MINE, 70 mi W of Lewiston, undergr, Ag, Pb, Cu, Zn, Au
Undgr devel
AMCERA MINE, 25 mi NE of Lewiston, undergr, Pb, Ag, Au
Under devel
WAR EAGLE MINE, 20 mi E of Lewiston, undergr, Zn, Pb, Ag
Under devel

LEWIS & VINCENT
Start
CALUMET MINE, Cedar Cr, Mineral City, placer, Au, Ag
LaCHAMBRE & TWIN CREEK MINES, Missoula County
placer, Au, Ag

LEXINGTON SILVER-LEAD MINES, INC
Neihart
BIG SEVEN MINE, near Neihart, Ag, Pb, Zn
Under devel

LIBERTY METALS CO
Troy
MINE, near Troy, Pb, Zn, Au, Ag
Under devel

LITTLE ROCKIES MNG & DEVEL CO
Landusky
Pres: Frank B Bryant
VP: Edward F Wieglenda
Sec & Treas: Cecil Flinders
Purch Agt: Marion Heller
LITTLE BEN MINE, Landusky, undergr, Au, Ag
Gen Mgr: Marion Heller
Supt: E E Wieglenda
Geol: F B Bryant
Prod: 100 tons
100-TON FLOT & CYAN MILL, Landusky
Mill Supt. Marion Heller
Assayer Frank B Bryant

LUCKY LEAD MINES, INC
219 Radio Central Bldg, Missoula
Pres & Gen Mgr. Earl T Ellis
VP: C Gale Gleason
Sec: Herbert C Fisher
Met: Carl C Martin
Geol: Earl F Elston
MONPARIEL MINE, 7 1/2 mi SE of Maxville, surface, Pb, Ag
Mine Supt. Orville Lammers
90-TON GRAV-FLOT MILL, Boulder Creek
Mill Supt: Ed Pierce

LUKE, RUSSELL B
1021 E Front St, Butte
JACK PINE PHOSPHATE MINE, 9 mi NE of Elliston, undergr,
Under devel
LUCKE'S SILICA QUARRY, 6 mi W of Anaconda, open pit

M & D MINES
c/o H R Maggoro, Rhame, North Dakota
MINE, Dillon, Dillon dist, Mn

MARIETTA MINES
Townsend
Part Al Dance & Harry Anders
MINE, undergr, Au, Ag, Pb, Zn
Gen Mgr Harry Anders
Prod: 10 tons

MARTIN MNG CO
Kalispell
Pres Hans Tutvedt
VP: Ben Schlegel
Sec-Treas. R T Flynn
MINE, Flathead County, undergr, Ag, Pb, Cu, Zn
Supt. Waino Lindbom
60-TON MILL

MASTER MNG CO
6223 Avondale Ave, Chicago, Ill
Pres. O L Rhoades
MINE, Gold Creed, Au, dragline dredge
Mgr: J H McIntosh

MIKE HORSE MINE
c/o Mr Porter, Helena
MINE, Heddleston dist, 30 mi E of Lincoln, Pb, Zn, Au, Ag
Under devel

MINERAL KING MNG CO
c/o C F Buis, Box 148, Missoula
MINERAL KING MINE, 3 mi N of Saltese, undergr & surface, Ag, Pd, Zn
Under devel

MINERALS ENG CO, MONTANA TUNGSTEN DIV
Box 94, Glen
Pres. Blair Burwell
VP Ray Sullivan
Gen Supt E M Craig
Purch Agt R W Warren
Mine Supt. D E Aro
Asst Mine Supt. J T Robison
BROWN'S LAKE MINE, 9 mi NW of Glen Mill, open pit, WO_3
Prod: 450 tons
CALVERT TUNGSTEN MINE, 7 mi W of Wise Riv, open pit, WO_3
Prod: 400 tons
CARTER IRON MINE, 8 mi E of Dillon, Fe
Under devel
1,000-TON FLOT MILL, 5 mi NW of Glen
Mill Supt. R F Evans
Asst Mill Supt: Nick Kurseck
(See Colo, N Mex, Utah)

MINNIE JANE MINE
Butte
MINE, 1 mi W of Butte, Mn

MITCHELL MNG CO
604 S 3rd, Mt Vernon, Wash
MARGET ANN MINE, Box 163, Butte, undergr, Ag, Au, Pb, Zn, Mn
Mine Eng: Maurice Turner
Prod: 75 tons
125-TON FLOT MILL, Walkerville
Assay: Hammond-Everly
(See Wash)

MONARCH COPPER & URANIUM MINES, INC
Box 33, Helena
Pres: D L Casey Jones
Sec: Herman Ingman
MONARCH MINE, 14 mi S of Elliston, undergr, Cu, U_3O_8, Au, Ag
Under devel

MONTANA COAL & IRON CO
Wallace
BLACK PINE MINE, in Idaho
Under devel
(See Idaho)

MONTANA GOLD & CHEM CO
c/o Montana Chem & Mig Corp
325 2nd Ave, Edgemont, S Dak
RESERVOIR, Gold Creek, Powell County, placer, Au, Ag
ROGERS HOMESTEAD MINE, Powell County, Au, Ag

MONTANA MNG & ENGR CO
Box D D, Philipsburg
Pres & Treas: F S Neal
VP & Sec. E T Irvine
BAGDAD MINE, 20 mi NW of Philipsburg, undergr, Au, Ag, Pb
Maps & Surveys: E T Irvine
Mine Supt: F S Neal
Asst Mine Supt: E T Irvine
Idle

MONTANA MNG & MLG CO
412 Power Block, Helena
VP: Don Hoskman
EMPIRE MINE, Hilmen, Marysville dist, Au, Ag, Pb, Cu

MONTANA PHOSPHATE PROD
Garrison
Pres: R B Shelledy
ANDERSON MINE, 11 mi NW of Garrison
GRAVELEY, GIMLET & LUKE MINES, 9 mi NW of Avon, undergr & open pit, phosphate rock
Gen Supt: F E Burnet
Mine Supt: C W Nixon
Mine Frm: C R McDonald
Geol: L V Bell
Mine Eng: A M Scott

MONTANA RAINBOW MNG CO
Marysville
Owner. W R Wade
Gen Supt: John Brophy
DRUMLUMMON MINE, Marysville, undergr, Au
Idle

MONTANA STANDARD MNG CO LTD
Box 307, Thompson Falls
Pres: Loy L Vose
MONTANA STANDARD MINE, Prospect Cr dist, Sanders City
Ag, Pb, Zn

MOOSE HILL MNG CO
c/o Kenneth B Morian
W 825 Main St, Spokane, Wash
WAYLET MINE, Lincoln County, WO_3
Under devel

MORNING GLORY MINE
c/o Claude Thornton, Troy
MINE, Vipond dist, Beaverhead County, Au, Ag, Cu, Pb
Under devel

MUS, RAYMOND
Box 274, Cooke
ST JUDE MINE, New World dist, Park County, undergr & surface, Ag Pb, Zn

NANCY LEE MINES, INC
410 Main St, Kellogg, Idaho
IRON MT & NIGHT OWL MINES, Mineral County, Ag, Cu, Pb
NANCY LEE GROUP, Superior, undergr, Ag, Cu, Pb, Zn
KING & QUEEN MINES, Ag, Cu, Pb, Zn
125-TON FLOT MILL

NATL LEAD CO, BAROID DIV
Box 1675, Houston 6, Texas
MINE, surface & undergr, Ba
GREENOUGH PLANT, jigging, grinding
Mine & Mill Supt: J P Murphy
(See Ark, Calif, Kans, La, Mont, Mo, Nev, N Y, Tenn, Tex, Wyo)

NEW ELKHORN QUEEN MNG CO
Boulder
ELKHORN QUEEN MINE, Jefferson County, Au, Ag, Cu, Pb

NINE MILE MINE
c/o William Lamon, Stark
MINE, Nine Mile dist, Missoula County, Au, Ag

NORTH STAR GROUP A
c/o R E Nichols, RFD 1, Toston
MINE, Cedar Plains dist, Broadwater County, Ag, Pb, Zn

NORTHERN MNG CO
Zortman
c/o George Setzer, Malta
MINE, Hawkeye Prop, 5 mi NE of Landusky, Au

PAYMASTER GULCH MINE
c/o H M & H G Kleinschmidt
Lincoln
MINE, Lincoln, Pb, Cu, Ag
Under devel

PEURA, LOUIS
1124 6th Ave, Helena
GREGORY & MINNESOTA DUMP MINES, Coin dist, Jefferson County, Au, Ag, Cu, Pb, Zn
Idle
HELENA & SILVER COIN MINES, Scratch Gravel dist, Lewis & Clark County, Au, Ag, Cu, Pb, Zn
Under devel
HOPE & FAITH MINES, Montana City dist, Jefferson County, Au, Ag, Cu, Pb, Zn
Idle
JULIA MINE, Scratch Gravel dist, Lewis & Clark County Ag, Cu, Zn
Idle
LIVERPOOL DUMP, Clancy & Lump Gulch dist, Jefferson County, Ag, Cu, Pb, Zn
Idle
PARK PEERLESS MINE, Helena dist, Lewis & Clark County, Au, Cu
Idle
WHITLATCH MINE, Helena dist, Lewis & Clark County, Au, Ag, Cu
MORNING STAR MINE, Amazon dist, Jefferson County Ag, Au, Pb, Zn
Idle
CLEVELAND MINE, Jefferson City dist, Au
Idle
NICK & DICK MINE, Canyon Ferry undergr, Pb, Ag, Cu
Prod: 10 tons daily
STRAY HORSE MINE, Winston, Broadwater County, Au, Ag, Cu, Pb

PIONEER CORP
Box 74, Missoula
MINE, Bonita, Missoula County, Mn

POLAR GOLD & COPPER CO
Twin Bridges
MINE, Old B & H property, NE of Twin Bridges, Au, Ag
Under devel

PONY TUNGSTEN ENTERPRISE CO
c/o Fred Box, Pony
STRAWBERRY MINE, 2 mi W of Pony, WO_3
Under devel
MILL

PRYOR MNG CO
c/o George Guay, 533 Howard Ave Billings
Pres: George Guay
OLD GLORY MINE, U_3O_8

PRYTANA MNG CO
c/o Walter Dean, Forsyth
Mgr: Walter Dean
Swamp Frog Mine, U_3O_8

QUEEN MINE
4 mi from Elkhorn
Pb, Ag, Au
Idle

QUEEN MNG CO
c/o J H Mellen, Drummond
MINE, Henderson Mng dist, Cu, Ag, Au, WO_3
Under devel

RALLS & HARRIS BROS
Radersburg
IRON CROSS MINE, Broadwater County, Fe

RELYEA, GEORGE A
Box 85, Garrison
RELYEA MINE, 11 mi N of Garrison, undergr, phosphate
Prod: 3,500 tons
(See Idaho)

RIVERSIDE MNG CO
Corbin
SILVER CLAIM MINE, Jefferson County, Ag, Cu, Pb

ROGERS, NORMAN
Mike Horse
BERTHA MINE, Summit Valley dist, Silver Bow Co, Cu
MIKE HORSE MINE, 20 mi E of Lincoln, Ag, Pb, Cu
ROUNDUP COAL CO
Roundup
MINE, Roundup area, Mn

RUSSKEN MNG CO
83 E Park, Butte
Pres & Mine Eng: Kenneth M Judd
VP & Gen Mgr: Roscoll B Lake
Sec-Treas: Harriet Judd
LUKE JUDD SILICA QUARRY, 8 mi W of Anaconda, open pit, silica
Prod: 5,000 tons per year

SANDSTROM, TOUR
Butte
SANDSTROM MINE, 9 1/2 mi E of Sheridan on Horse Cr, Ag, Au
Idle

SHAVER-COBBLET-KNAPP
Dillon
GOLDSMITH MINE, Argenta dist, Beaverhead County, Au, Ag, Pb, Zn, Cu

SILVER CRESCENT MNG CO
Box 195, Helena
Pres & Gen Mgr: William A Hall
VP: C S Alison
Sec: Rulbin Undereth
Directors: Geo Grade & A F Edward
CRESCENT, PEERLESS & SILVER CRESCENT MINES, 13 mi S of Helena, Au, Pb, Ag, Zn, Cu

SILVER HILL MNG CO
Bannack
SILVER HILL MINE, Jefferson County, Au, Ag, Cu, Pb

SIMON & FORTUNE
315 S Jackson St, Butte
LAVINA MINE, Butte dist, Mn

SIMPLOT CO, J R FERTILIZER DIV
Box 813, Pocatello, Idaho
Gen Mgr: W Grant Kilbourne
CENTENNIAL MINE, Monida, 38 mi E of Monida, open pit, phosphate
Mine Mgr: P T Peterson
Asst Mine Mgr: C Sweetwood
Mine Eng: Leonard Garrard
Prod: 1,500 tons
(See Idaho, Nev, Wyo & Warren Dredging Corp in Idaho)

SIN HOMBRE MINES
Box 314, Gardiner
Pres & Treas: Thomas J Hallin
VP: Theadore T Mosley
Sec: Donald Cameron, Jr
MINES, Crevasse dist, Park County, undergr, WO_3, Au, As, Ag
Gen Mgr: Donald Cameron, Jr
Geol: Thoman J Hallin
Idle

SWANSEA MINES, INC
Box 904, Helena
Pres & Gen Mgr: C L Hewitt
SILVER BELL MINE, 40 mi NW of Helena, undergr, Au, Ag, Cu, Pb
Under devel

TAYLOR-KNAPP CO
Box 87, Philipsburg
Pres: F R Knapp
VP & Gen Mgr: A V Taylor
Sec & VP: Ali C Kremer
Mgr: Donald S Johnson
Ch Eng: Charles P Knaebel
MOORLIGHT GROUP, Philipsburg undergr, Mn, Ag, Zn, Pb
Gen Supt: Jack B McCoy
Geol & Eng: M D Regan
Ch Accountant: Claude Sorensen
Mine Frm: C H Reistad
100-TON GRAV-MAG MILL, Philipsburg
Mill Frm: G Knouis
Assay: F S Neal

TEXAS INSTRUMENT, INC
6000 Lemmon Ave, Dallas 9, Texas
VERMIONLITE MINE, Rocky Boy's Agency, Box Elder, Hill County, U_3O_8
Under devel

TINDALL, FORREST V
Lewistown
MINE, N of Ft Maginnis, Judith Mts,
Under devel

TIP TOP MNG CORP
1811 W Park, Anaconda
TIP TOP MINE, Deer Lodge County, WO_3
Under devel

UMONT MNG CO
Silver Bow Block, Butte
NORWICH MINE, 2 mi W of Butte, Mn

U S GOLD CORP
405 Cedar St, Seattle, Wash
B & H MINE, Tidal Wave dist, 12 mi NE of Twin Bridges, Madison County, Au, Ag, Cu
Under devel

U S GYPSUM CO
Heath
HEATH MINE, Undergr, gypsum
Works Mgr: W E Seeburger
(See Calif, Colo, Conn, Ill, Ind, Iowa, Mass, Mich, Nev, N Mex, N Y, Ohio, Okla, Tex, Utah, Va)

URANIUM CORP OF AMERICA
1101 Failing Bldg, Portland 4, Ore
DAILY COPPER MINES, Wickes, Cu Pb, Zn, Ag, Au

VAN MATRE, W J
Butte
MINE, Sheep Cr area, Ravalli County Cb, monazite, rare earth minerals
Under devel

VERMILLION URANIUM CORP
c/o A Ben Cox, Thompson Falls
Pres: A Ben Cox
MUSTER KNOB NO 1, 2, ALICE PUMKIN, GREEN STREAK, BRIGHT SUN, & U_3O_8 No 1-8 MINES, Sanders County, U_3O_8
Under devel

VICTOR CHEMICAL WORKS
155 N Wacker Dr, Chicago 6, Ill
Supt: L O Streitmaher
Prod Supt: C Hendrickson
Supt, Mng Oper: Henry Johnson
MINE, Maiden Rock, undergr, phosphate rock
ELEMENTAL PHOSPHORUS PLANT
Silver Bow, Electric Furnacing
(See Fla, Ill)

WESTERN AMERICA OF MONT
Box 742, Helena
Treas: Vern Leonard
Purch Agt: Dave Bower
MORNING & MIDNITE MINES, Basin, undergr, Pb, Zn, Au, Ag, Cu
Geol: Dick Miller
Under devel
(Leased from D A DuBois & G C Bulshue)

WESTERN MINES CO
c/o Pat Phalen, Helmville
MINE, Ogden Mt mng dist, 10 mi NE of Helmville, placer, W, Au
Under devel

WHITE DEVEL CO
Box 72, Whitehall
GOLDEN SUNLIGHT MINE, Jefferson County, Au, Ag

YELLOWSTONE URANIUM CO
Box 516, Hardin
Pres: A A Moser
VP, Gen Mgr & Geol: Dean Cummins
Sec-Treas & Mine Supt: R C Cosgrove
SHAMROCK MINE, Silverstar, open pit, Cu
Under devel
Prod: 40 tons

YOUNG-MONTANA CORP
2223 1st Ave, Hibbing, Minn
Pres: E A Young
VP: Joseph Lovallo
Sec-Treas: Thomas McCabe
WILLOW CR MINE, Stanford, 18 mi N of Stanford, open pit, Fe
Mine Frm: Phil Solmonson

ZIMMERMAN, WILLIAM
Townsend
ERICKSON NO 1, 2, 3 MINES, Park or Indian Cr, Broadwater County, Au, Ag, Pb

ZODIAC URANIUM, INC
320 Ness Bldg, Salt Lake City, Utah
Geol: Leland J Davis
Prop near Dillon, Pb, Cu, Au, Ag
Under devel
(See Ariz)

ZONOLITE CO
135 S LaSalle St, Chicago 3, Ill
Pres: J D Myers
VP, Chg Prod: J A Kelley
MINE, Libby, open pit, vermiculite concentrates
Gen Mgr: R A Bleich
Asst Gen Mgr: E D Levick
Geol: R J Kujawa
Mech Eng: D W Robinson
Met: J B Calkins
Purch Agt: B J Dorrington
Mine Supt: R J Kujawa
Mine Frm: Orville Thorne
3,000-TON GRAV MILL, near Libby
Mill Supt: Harold Platt
Mill Frm: Walter Baker
(See Ill)

NEBRASKA

AMER SMLTG & REF CO
OMAHA SMLTR & REFINERY
Omaha
Mgr: Ray C Show
Gen Supt: J C Reichardt
(See Ariz, Calif, Colo, Idaho, Ill, Kans, Md, Mont, N J, N Mex, N Y, Tex, Utah, Wash & Federal Mng & Smelting Co, Mo)

NEVADA

ALA, JOHN F & DAZ, LUCY
Montello
MINE, DELNO, 40 mi N of Montello undergr, Pb, Ag
Mgr: John F Ala

ALHAMBRA CONSOL MINES, INC, NEVADA CORP
Rm 110, 300 Fremont St, Las Vegas
CLAIMS (50), Goldfield, Au, Mn, Pb
(See Calif, Utah)

ALLIED OIL & MINERALS CO
409 Ness Bldg, Salt Lake City Utah
Pres: P C Lyon
Gen Mgr: P C Lyon, Jr
GOLD NOTE MINE, 57 mi S of Winnemucca, undergr, Pb, Ag, Au, Zn, Cu
Under devel

AMERICAN WESTERN EXPLOR CO
127 Montgomery St, San Francisco, Calif., c/o Murray A Schuth
MARSHALL MINE, Elko County, Cu

ANACONDA COMPANY, THE YERINGTON MINES
Box 1000, Weed Heights
Gen Mgr: A E Millar
Asst Gen Mgr: H R Burch
Mine Supt: C J Houck
Plant Supt: A J Gould
Gen Mine Frm: D K Gill
Gen Plant Frm: F M Monninger
Ch Clerk: H L Chesarek
Pers Superv: K W Humphreys
Storekeeper: R K Owen
Master Mech: R E Bentley
Superv Rep & Maint of Mobile Equip: W M Crews
Ch Elect: M H Bissett
YERINGTON MINE, 81 mi SE of Reno, surface, Cu
Prod: 12,000 tons
12,000-TON LEACH & PRECIP PLANT
(See Calif, Idaho, Mont, N Mex, N Y, Utah)

APEX MINERALS CORP
317 Clay Peters Bldg, Reno
Pres: Carson Frazier
VP: Wm Crowell
Sec: Walter Naismith
Purch Agt & Gen Supt: A A Carrey
Gen Mgr: Fred Vollmar
Geol: Phil D Wilson, Harry Hughes
Met: Albert Silver
APEX URANIUM MINE, Austin, U_3O_8
300-TON MILL, Austin
Mill Supt: Albert Silver

APEX URANIUM INC OF NEVADA
Box 130, Reno
Pres: Frank Chartier
VP: Alexander Ferguson
Sec: Richard Sanguinetti
Purch Agt: Hugh Cameron
MINE, Box 293, Austin, 6 mi S of Austin, undergr, U_3O_8
Gen Mgr: W R Noack
Gen Supt: Hugh Cameron
Geol: Harry Hughes
Prod: 15 tons

ARGENTINA CONSOL MNG CO
Box 7, Goodsprings
ARGENTA MINE, 3 mi S of Goodsprings, undergr & surface
Zn, Pb
70-TON FLOT-CONCEN MILL
Idle
(See Calif)

ARGENTUM MNG CO OF NEVADA
Box 151, Mina
Pres: E S Gates
NORTHERN BELL & HOLMES MINES, Mineral County, Au

ATLANTA GOLD & URANIUM CO
Box 248, Pioche
Pres: J E Little

VP & Gen Mgr: C E Collins
Sec-Treas: Wm S Robertshaw
ATLANTA MINE, 51 mi NE of Pioche, Atlanta dist, open pit, Au, Ag, U_3O_8
Under devel

AUSTIN, W G
Winnemucca
IRON KING MINE, 31 mi N of Jungo, open pit, Fe

BALTIMORE CAMAS MINES INC
601 Eastman Bldg, Boise, Idaho
Pres: G P Williams
VP: Fred Jaquith
Sec-Treas: George W Dana
100-TON GRAV-FLOT MILL, Ely
(Leased to Minerals Engr Co of Grand Junction, Colo)

BARIUM PRODUCTS, LTD (SUBSID OF FOOD MACH & CHEM CORP)
Battle Mountain
Gen Mgr: G M Stark
Gen Supt: A L Allen
MT SPRINGS & ARGENTA MINE, 22 mi S of Battle Mt, surface, barite
Mine Supt: James Jury
Mine Frm: C N Lauritsen
Prod: 200 tons
(See Barium Products, Calif; Intermountain Chem, Wyo)

BASIC, INC
Gabbs
Works Mgr: N P Willard
Mine Supt: A M Dixon
Mill Supt: F W Menzl
Purch Agt: R A McDonald, Jr
GABBS MINE, surface, magnesite, brucite
Prod: 500 tons
(See Ohio)

BATTLE CREEK MINE
Box 5, Wells
MINE, 55 mi S of Wells, open pit & undergr, Pb, Zn, mica, WO_3
Mgr: Max Irwin
Idle

BATTLE MT COPPER CO
Box 62, Battle Mt
COPPER CANYON & COPPER BASIN MINES, Box 248, Battle Mt, 18 mi SW of Battle Mt, undergr, open pit, Cu, Au, Ag
Res Mgr: Robert H Raring
Lessee: A R Hider
Idle
COPPER CANYON FLOT MILL, at mine

BEOWAWE BARIUM PROD ASSN
Beowawe
Pres: Carl Hammam
VP: Joe Thomas
Sec: C F Stone
Gen Mgr: Dick Edgar
Asst Gen Mgr: Gene Harris
Mgr: Lee Lakin
Mech Engr: L L Mauldin
Purch Agt: C F Stone
FIVE PITS, 23 mi S of Beowawe, surface, crude barite
(Leased to Magnet Cove Barium Co)

BIG FOUR MNG & MLG CO
P O Box 210, Lomita, Calif
MINE, Nipton, open pit
(See Calif)

BLACK METAL MNG CO
218 Felt Bldg, Salt Lake City, Utah
BLACK METAL MINE, Lincoln County, Ag

BLUE DIAMOND CORP
1650 S Alameda St, Los Angeles Calif
Pres: N J Redmond
VP: W G Bradley
Sec: T L Donoghue
Purch Agt: B M Martz
BLUE DIAMOND MINE, Blue Diamond undergr, open pit, gypsum
Gen Mgr: H L Waldthasen
Asst Gen Mgr & Mech Engr: R R White
Elec Engr: Robt Dunnegan
Geol & Supt: Joe Cain
Prod: 1,400 tons
1,400-TON MILL, at mine

BLUE JACK CORP
c/o Don R Johnstone & Assoc, 23 W 4th St, Winnemucca
BLUE JACK GROUP, Humboldt County, Cu

BLUE JACKET MNG CO
924 Main St, P O Box 942, Boise, Idaho
BLUE JACKET GROUP, Elko County, Au

BOYD-ENDSLEY MNG CO
P O Box 102, Beatty
LIME CAP MINE, Nye County, Mg

BRADLEY & ECKSTROM, INC
24 California St, San Francisco 11, California
MINES, variety of minerals
(See Ariz, Calif, Idaho, Oreg, Utah)

BRADLEY MNG CO
660 Market St, Rm 515
San Francisco 4, Calif
Pres: Worthen Bradley
Exec VP: John D Bradley
VP: Jas P Bradley
Sec: G C Orton
GOLDBANKS MINE, Winnemucca, surface, Hg
Cons Eng: T C Hapgood
Leased
(See Calif, Idaho)

BRISTOL SILVER MINES CO
218 Felt Bldg, Salt Lake City 1, Utah
Pres: George W Snyder
VP: Edward H Snyder
Sec-Treas: C M Christensen
BRISTOL SILVER MINE, Pioche undergr, Cu, Ag, Pb, Zn, Au, Mn
Gen Mgr: Byron S Hardie
Gen Supt: Harry Pollar
Purch Agt: Hoyt Adair
Prod: 50 tons

BRUHI MNG CO
Silver Peak
MOHAWK MINE, Argentite, undergr, Ag, Au
Idle
Mgr: W Church Holmes
CYAN MILL, Silver Peak

BUENO RICO MINE
825 Lodge Ave, Reno
BUENO RICO MINE, Pyramid Mng dist, 32 mi N of Reno, undergr, Cu, Ag, Au
Mine Supt: James C Schenk
Mine Frm: Robert C Schenk
Under devel

BURNER MINES & MNG
Box 576, Elko
Owner-Op: Jake M Burner
SUMMIT KING, MOUNTAIN VEIN MINES, Elko, Corrail Cr, 15 mi E of Jiggs, undergr, open pit, Pb, Zn
COMPLEX TUNGSTEN MINE, Corrail Cr, undergr, WO_3
Under devel

C & C TUNGSTEN MNG CO
245 University Terrace, Reno
Pres & Mgr: Jay A Carpenter
VP: J P Hart
Sec: Elizabeth C Riker
LINKA MINE, 20 mi E of Austin, undergr, WO_3
250-TON MILL
(Mng Oper by Consol Uranium Mines, Inc)

CALIENTE COBALT MNG CO
132 S Main St, Salt Lake City, Utah
CALIENTE COBALT MINE, Lincoln County, Au

CASTLE PARK MNG CO
Box 388, Carlin
SKOOTUMPAW MINE, Elko County, Cu

COLUMBIA MINE
Box 1280, Ely
Gen Mgr: Sam M Robison
MINES, 1 mi E of Ruth, undergr, Mn, Zn, Pb, Cu, Au, Ag
Producing
GRAV MILL

COMBINED METALS REDUCTION CO, NEVADA OPERATIONS
Pioche
Gen Mgr: Paul Gemmill
Asst Mgr: H E Swanson
Gen Mine Supt: R G Lee
Gen Mill Supt: W G Fidler
CASELTON MINE, 5 mi W of Pioche undergr, Zn, Pb, Ag, Mn
Mine Frm: J L Stewart
Eng: O E Schrader, Jr
Prod: 5,000 tons per month
COMET MINE, 20 mi W of Pioche, undergr, Zn, Pb, Ag, WO_3
700-TON CASELTON MILL, FLOTHMS, Zn, Pb, Ag, Mn
Frm: R H Werber
Ch Chem: Lyle R Stiver
400-TON PANACALITE MILL, Crushing & grinding, crude perlite
(See Utah)

COMSTOCK URANIUM & OIL CORP
311 Phillips Petroleum Bldg, Salt Lake City, Utah
FRETZ MERCURY MINE (ARENTZ-COMSTOCK MNG VENTURE), McDermitt, 13 mi NW of McDermitt, Malheur County, Oreg, open pit, Hg
Gen Supt: Roy Hickman
Mng Eng: Paul M Sorensen
Prod: 700-900 tons
100-150-TON FLOT MILL, at mine
Ratio: 40:1 concentrate
(See Utah)

CONSOL COPPERMINES CORP
Kimberly
VP & Gen Mgr: Arthur J O'Connor
Supt of Oper: J Frank Sharp
Geol: J McLaren Forbes
Ch Acct: Wayne Manson
Ch Eng: C R Sacrison
Ch Elec: William Shields
Ch Chem: Louis Mathis
TRIPP COPPER PIT, & INTERESTS IN COPPER FLAT PIT & VETERAN, Ruth, surface, Cu, Au, Ag, Mo
Mine Supt: W J Latvala
Frm: J C Perkins
Prod: 9,000 tons
(See N Y)

CONSOL EUREKA MNG CO
Eureka
Gen Mgr: Sherman R Hinckley
Asst Gen Mgr & Mine Supt: Dean P Thirlet
DIAMOND MINE, 2 mi from Eureka, undergr, Pb, Ag, Au
Prod: 25-30 tons
(See Utah)

CONSOLIDATED URANIUM MINES, INC
438 S Main St (Box 2578) Salt Lake City, Utah
LINKA MINE, near Austin, undergr, WO_3
Supt: D E Anderson
LINKA MILL, at mine
Supt: Sam Mele
GUN METAL MINE, Near Mina, WO_3
Supt: Gus Hokanson
NORTH TEM PIUTE MINE, Lincoln County, WO_3
Supt: Roland Cox
(See Colo, Utah)

CONSOL VIRGINIA MNG CO
(See Subsid HAMPTON MNG CO, Calif)

COPPER HILL MINE
1235 Palisade Drive, Reno
Own: Harve P Nelson, James C Schenk, Robert C Schenk
COPPER HILL MINE, 16 mi N of Reno, undergr, open pit, Cu, WO_3
Under devel

CORDERO MNG CO
131 University Ave, Palo Alto, Cal
VP: S H Williston
CORDERO MINE, McDermitt, 12 mi SW of McDermitt, undergr, Hg
Gen Mgr: J Eldon Gilbert
Asst Gen Mgr: Verne P Haas
Gen Supt: Bert Mitchell
Supt: Cliff Altig
100-TON MILL, at mine
RETORT FURNACE, at mine
(See Calif, Idaho, Oreg)

CRYSTAL MNG CORP OF NEVADA
1004 Fremont St, Las Vegas
Pres: J Bullock
VP: G Totten
Sec-Treas: O C Mudd
CRYSTAL MERCURY MINE, undergr & open pit, Hg, Mo
(Leased to Mormon Trails Mng Corp)

DAKIN, FRED E
2811 Hillside Dr, Burlingame, Cal
CERVANTITE MINE, 23 mi E of Lovelock, undergr, Sb
Idle

DE LONGCHAMPS, F J
Box 2344, Reno
TALAPOOSA MINE, 15 mi S of Fernley, Au, Ag
Idle

DODGE CONSTRUCTION, INC
Box 266, Lovelock
MINE, 25 mi SE of Lovelock, open pit, Fe
Supt: Frank H Dunn

EAGLE-PICHER CO INSUL DIV
Box 1868, Reno
Gen Mgr: John W Kenney, Jr
Asst Gen Mgr: Milton S Steinheimer
CELATOM MINE, Clark Station, open pit, diatomaceous earth
Mine Supt: H C Smith
MILL, Air classification, at mine
Mill Supt: Frank J Dodick
(See Ariz, Ill, Kans, Ohio, Okla, Wis)

EASTER SUNDAY MNG, INC
1202 Mark Twain Ave, Reno
(See Calif)

EDGEMONT MNG CO
Tonopah
Mgr: T C Hedlund
EDGEMONT MINE, undergr, Au
Under devel

EL CAPITAN MNG CO
Box I, Gabbs
EL CAPITAN TUNGSTEN MINE, 8 mi NE of Gabbs, undergr, WO_3
Mgr: Gordon H Smith

ELY VALLEY MINES, INC
Pioche
Pres & Gen Mgr: John Janney
Sec: Sherm Hickman
Supt: Bruce Condie
ELY VALLEY MINE, undergr, Zn, Pb
Under devel

ERRINGTON-THIEL MNG CO
Ruby Valley
Part: Oscar W Thiel
Mrs Alma T Errington
BIG MICA MINE, Ruby Valley, 65 mi SW of Wells, undergr & surface, ruby mica, beryl, rare minerals
HOLIDAY COPPER MINE, 50 mi S of Wells, undergr & surface, Cu Zn, rare minerals

ETCHART, JOHN
Box 1, Golconda
RILEY MINE, 40 mi NE of Winnemucca, Potosi dist, undergr & open pit, WO
Frm: John Mayeroff
WHITE PEAKS QUICKSILVER MINE, 426 Bridge St, Winnemucca, 80 mi NW of Winnemucca, undergr, Hg
Supt: Leonard Simpson
Under devel

EUREKA CORPORATION, LTD
Eureka
Pres: Thayer Lindsley
VP & Gen Mgr: George S Mitchell
Sec: A C Glow
Treas: P W Zeckhausen
Purch Agt: Willis A DePaoli
RICHMOND-EUREKA MINE, 2 mi W of Eureka, undergr, Pb, Au, Ag
Gen Supt: Robert N Breckenridge
Geol: Phillip R Miller
Mine Supt: Vernon Mann
Mine Frm: Edward Meske
Mine Eng: Walter Parent
Under devel

FAIRHAVEN URANIUM MINES INC
Box 261, Lovelock
Pres & Gen Mgr: Gene Jack
VP: Fred M Jaquith
Sec-Treas: B M Andrews
LINCOLN HILL MINE, Rochester Mng dist via Oreana, 20 mi E of Lovelock, undergr, U_3O_8, Au
Mine Frm: Ernest Albrecht

GABBS EXPLORATION CO
Drawer I, Gabbs
Pres: Lee D Dougan
VP: Ellen M Dougan
Geol: Bernard York
VICTORY TUNGSTEN MINE, 8 mi N of Gabbs, undergr, scheelite
Mine Frm: Charles Bonta
Prod: 100 tons
100-TON GRAV-FLOT MILL, Gabbs
Mill Supt: W M Dougan

GARDNER MINES
Box 413, Ely
Gen Mgr: C A Gardner
MINERAL FARM & MERRIMAR GPS, 20 mi SE of Ely, undergr, Au, Ag, Pb
Prod: 5 tons

GAR PAC, INC
2419 S 5th St, Suite 11, Las Vegas
Pres, Gen Mgr & Treas: Pace Foster
VP & Asst Gen Mgr: Garlin Davis
Sec: Stan Betty
Purch Agt: Ray Burgi
Office Mgr: Pat Foley
(See Ariz, N Mex)

GETCHELL MINE, INC
Box 2530, Reno
Pres: George Wingfield
VP & Gen Mgr: H M Getchell
Sec-Treas: T L Willcox
Gen Supt: Keith Kunze
VP & Geol: Roy A Hardy
GETCHELL MINE, Golconda, undergr & surface, WO_3

Mine Supt: Wm J Newman
Asst Mine Supt: Elmer Snell
Assay: Roy Nojima
Prod: 900 tons
1,500TON FLOT MILL, near Unaconda
Mill Supt: Ed Buchanan
Mill Frm: David Kinzel

GOLD ZONE MNG CORP
200 Davis St, San Francisco 11 Calif
Pres: Hans Hammer
VP: M E Bohannan
Sec-Treas: Albert S Simrak
FAY MINE, White Pine County, Pb, Zn
RAIN CLOUD MINE, Humboldt County U_3O_8
OLD ABE, Tonopah, Ag
Idle

GOLDEN ENSIGN MNG CO
Box 1475, c/o W A Wright, Salt Lake City, Utah
GOLDEN ENSIGN MINE, Mt City, undergr, Ag, Au
Idle
Gen Mgr: Joseph E Geertsen
Asst Gen Mgr: Ralph M Jones
Geol & Eng: Jean R Driggs

GOLDFIELD CONSOL MINES CO
Box 2520, Reno
Pres: George Wingfield
Exec VP: Willis A Swan
Sec-Treas: Geo M Spradling
(See Calif, Wash)

GRAND DEPOSIT MNG CO
409 Newhouse Bldg, Salt Lake City, Utah
GRAND DEPOSIT MINE, Ely, undergr, Pb, Zn, Cu, Ag, Au
Gen Supt: Paul C Lyon, Jr
Under devel

GRANDVIEW MNG & MLG CO
Goldpoint
Pres: J S Wisdom
VP: Helen Wisdom, Fred Palmer
Sec-Treas: John Westhaver
Purch Agt: Floyd R Bekins
Gen Mgr: Frank Gomes
Asst Gen Mgr: Bill Sutton
Geol: Karl Dreyssiesen
Met: E Eisenhauer
BRIGHT STAR MINE, undergr, Au, Ag, WO_3
Mine Supt: Smokie Smith
Asst Mine Supt: Jack Footch
Mine Frm: B C Boone
Prod: 10 tons
WELLINGTONS MINE, Tule Canyon, undergr, open pit, steatite-cosmetic-pharmicetal talcs, ceramic talc
Mine Supt: Bill Sutton
Mine Frm: Frank Gomez
Prod: 16 tons
15-TON GRAV MILL, Sylvania Canyon
Mill Supt: Gare Neberher

GRAKO-LITE GOLD MNG CO
Box 337, Yerington
Pres & Gen Mgr: W E Slater
VP: John W Barrett
Sec-Treas: Wm E Dial
GRAKO-LITE URANIUM MINE, 17 mi SE of Wellington, undergr, U_3O_8
Under devel

GREAT LAKES CARBON CORP, DICALITE DIV
Basalt via Tonopah
PLANT No 3, surface, diatomaceous earth
Supt: Carl F Schuholz
50-TON MILL
(See Calif, Colo, N Mex, Oreg)

GREY EAGLE DEVEL CO
c/o Fred G Risley, Tonabo via Beowawe
GREY EAGLE MINE, Lander County, Ag

HANCOCK IRON MINE
Box 245, Battle Mountain
Owners: W R & Vera Hancock
MINE, 32 mi S of Battle Mtn, open pit, Fe
Idle

HELMAR ENTERPRISES, INC
Ely
TUNGSTONIA MINE, 90 mi NE of Ely, Regan dist, undergr, WO_3
Mgr: Gerrett H Bryant
GRAV MILL, at mine

HERCULES MINES CO OF NEVADA
317 Clay Peters Bldg, 140 N Virginia, Reno
Pres: Carson Frazini
VP: Alexander Ferguson
Sec: Walter Naismith
HERCULES MINE, Box 292, Austin undergr, Ag, Pb, Cu
Gen Mgr & Purch Agt: Hugh Cameron
Geol: Harry Hughes
Under devel

HORSE CANYON MNG CO
c/o R M Carido, 305 E Campbell Ave, Campbell
HORSE CANYON MINE, Nye County, Hg

IDAHO NEVADA URANIUM CORP
Albion, Idaho
QUEEN CLAIMS NO 1-12, AJAX 1-6, LARK 1-4, LONGHIKE 1-3, 10 mi S & 3 mi W of NE corner of Nevada, Elko County, open pit, Mn, Ti, Zr
Pres & Gen Mgr: Otto R Ward
Under devel
(See Idaho)

INDEX-DALEY MINES CO
118 N Main St, Salt Lake City, Utah
BULLSHEAD MINE, Wells, undergr, open pit, Cu, Pb, Ag
Gen Supt: George A Rich
Under devel
(See Utah)

INDUSTRIAL MINERALS & CHEMICAL CO
6th and Gilman Sts, Berkeley 10, California
Pres: L R Moretti
VP: W S Cowgill
Sec-Treas: A L Forbes
JUPITER MINE, Lyon County, open pit, clay
(See Calif)

INTERSTATE MNG & EXPLOR CORP
1036 1st Nat'l Bank Bldg, Denver 2, Colo
U_3O_8 PROSPECTS
(See Ariz, Colo)

ISBELL CONST CO
Box 8251, Reno
Pres: C V Isbell
Ch Eng: H R Noel
Purch Agt: W J Henley
COPPER MINE, open pit, contract mng for Consol Coppermines
Supt: Ted Maestretti
THREE KIDS MINE, open pit, contract mng for Manganese, Inc
Supt: George Laughton
(See Calif, Utah, Wash)

K & J MNG CO
c/o George Kosmos, Lovelock
BLACK JACK MINE, Pershing County, Hg

KAISER ALUM & CHEM CORP
Box 391, Fallon
Gen Supt: L F Muller
Purch Agt: H F Mayhew
KAISER MINE, 12 mi E of Fallon undergr, CaF_2
Mine Supt: Geo Dasher
Prod: 120 tons
120-TON FLOT MILL, Fallon
Mill Supt: Robert Ginn

KENNECOTT COPPER CORP NEVADA MINES DIV
McGill
Gen Mgr: J C Kinnear, Jr
Asst Gen Mgr: M J O'Shaughnessy
Purch Agt: W N Ireland
Div Comptroller: R W Crosser
RUTH PIT, VETERAN MINE, ReS, open pit, Cu, Au, Ag, MoS
Gen Supt, Mines: S W Smith
Pit Supt: Frank Quilici
Ch Eng: K W Booker
DEEP RUTH MINE, Ruth, undergr, Cu, Au, Ag, MoS
Undergr Mine Supt: R C Nispel
21,000-TON FLOT CONCENTRATOR, 2 REVERB SMELTERS, McGill
Concen Supt: W J Akert
Smelt Supt: E Pescot
Mech-Elect Supt: W K Sanders
Construction Supt: W F Jones
Prod: 100,000,000 lbs Cu yrly
NEVADA NORTHERN NY (Subsid)
Gen Supt: H M Peterson

KING SOLOMON MNG CO, INC
519 E Carson, Las Vegas
(See Calif)

KLABUNDE, L A
2001 Prater Way, Sparks
Own & Op: L A Klabunde
BUTCH GROUP, Nixon, 24 mi NE Nixon, undergr, WO_3
Mine Supt: Melvin C Bowles
Under devel

L & G MNG CO
Box 2, Gabbs
MOHAWK MINE, Esmeralda County, Au

L & N MNG CO
1120 10th Ave N, Seattle 2, Wash
TRENTON CANYON COPPER MINE, Battle Mt, undergr, open pit, Cu, Ag, Pb, WO_3
Gen Supt: V R Newbury
Geol: Forbes Robertson
Under devel
(See Wash)

LONDON EXTENSION MNG CO
Beowawe
Pres: Fred C Bishop
VP: R W Fraser
Sec & Gen Mgr: H C Bishop, Jr
Supt & Treas: R B Warmbrodt
GOLDACRES MINE, 30 mi S of Beowawe, surface, Au, Ag
Supt: E E Mahoney
Mine Frm: Angelo Manconi
Prod: 450 tons
450-TON CYAN MILL, at mine
Supt: C E Stewart
Asst Supt: Harold Bahl

LUCKY-9 URANIUM INC
4275 Neil Rd, Reno
Pres: P A Denton
Exec VP: R E Giannotti
VP: Grant McCoy
Sec-Treas: Mary Agnes Denton
LUCKY-9MINE, Yerington, undergr, surface, U_3O_8
Under devel

M. I. A. MINES CO
Pioche
MINERVA MINE, 30 mi S of Ely
Minerva dist, undergr, WO_3
Mgr: R L Brittain
Idle

MAGNET COVE BARIUM CO
Beowawe
FIVE PITS, 23 mi S of Beowawe, surface, crude barite
(Leased from Beowawe Barium Prod Assn)
(See Ark, Tex, Wyo)

MANGANESE, INC
Box 2008, Henderson
Gen Mgr: Royce A Hardy
Ch Met: Ellis Gates
Gen Supt: John S Anderson
Purch Agt: L D Richardson
Asst Gen Supt: William Kendrick
THREE KIDS MINE, 8 mi E of Henderson, surface, Mn
Mine Supt: Victor Howard
Mech Eng: R Waters
Mine Eng: C Hawkins
Elec Eng: Russell Frith
Controller: H M Alarid
Prod: 2,000 tons
2,000-TON FLOT MILL, at mine
Mill Supt: R Blake
Asst Mill Supt: Edward Lowman
(See N Y)

MANHATTAN CONSOL MINES DEV CO
Box 351, Tonopah
Pres: J Fred McCulloch
Sec: Nick J Barbarich
(See Ariz)

MERCURY-URANIUM MNG CO
c/o L B Sammons, Tonopah
A & B MINE, M & M MINE, Nye County, Hg, U_3O_8

METALLURGICAL DEVEL CO, INC
P O Box 101, Gardnerville
Pres: Emery W Greenlee
VP: Joe Michaelson
Sec-Treas: Paul Laxalt
MINE, 12 mi E of Gardnerville
Pinehut dist, Pb, Ag, WO_3
50-TON FLOT-GRAV MILL, at mine
Mill Supt: Joe C Morris

MINERAL GYPSITE CORP
Box 77, Mesquite
LAKESIDE MINE, Clarke County, Cu

MINERAL MATERIALS CO
1145 Westminster Ave, Alhambra, Calif
Gen Mgr: C W Dunton
Gen Supt: M W Redhead
Geol: W N LaBounty
Mine Supt: M C Graham
800-TON MILL, at mine, jaw crusher, rolls, magnetic separators
Mill Frm: M C Graham
BUENA VISTA MINE, Lovelock surface, Fe
Prod: 800 tons
(See Calif)

MINERVA SCHEELITE MNG CO
Box 994, Ely
Gen Mgr: R Stepper
SCHEELITE CHIEF, 90 mi SE of Ely, undergr, WO_3
Prod: 35 tons
35-TON GRAV MILL, 48 mi SE of Ely

MT WHEELER MINES INC
Ely
POLE CAT, BONANZA, CANAAN, POLE & ST LAWRENCE MINES, 47 mi SE of Ely, Mt Wash dist, undergr, WO_3, Pb, Ag, Zn
Supt: Ben L Sheppard
Frm: Frank Ewell
(Under devel by contract to Centennial Devel Co)

N & M MINING CO
Ione
Pres: H F Newman
Sec: Ed B Moore
Treas: D A Newman
COPPER KING GROUP, 3 mi S of Ione, undergr, Cu
Under devel

NATIONAL LEAD CO
111 Broadway, New York 6, N Y
MINE, Battle Mountain, Lander County, barium
(See Ark, Calif, Kans, La, Mo, Mont, N Y, Tenn, Tex, Wyo)

NEVADA PARK MNG CO
P O Box 37, Provo, Utah
MINE, Silver Park Mng dist, Lincoln County, undergr, Au, Ag
Prod: 29 tons
(See Utah)

NEVADA-MASSACHUSETTS CO
Tungsten
Pres: C H Segerstrom
VP: M D Cronwall
Treas: M D Jones
Gen Mgr: E Nash
TUNGSTEN MINE, 9 mi N of Mill City, undergr & Surface, WO_3
Mine Supt: D O'Keefe
Mine Eng: Ralph Gruning
Prod: 400 tons
800-TON GRAV-FLOT MILL
Mill Supt: J R Caldwell
Assayer: R V Noble

NEVADA MINES CO
c/o Walter J Timney, 2001 Pinto Lane, Las Vegas
(See Colo)

NEVADA PERLITE CO
1414 Industrial Road, Las Vegas
Pres: James H Bradford
VP: J A Tiberti
Sec-Treas: George Von Tobel
PERLITE PROCESSING PLANT, Las Vegas
Capacity: 10,000 cu ft expanded perlite per day

NEVADA SCHEELITE CORP
(Subsid of KENNAMETAL INC)
430 S Maine St, Fallon
Pres: Donald C McKenna
VP & Gen Supt: E M Colwell
Asst Sec & Purch Agt: Geraldine Marsh
Acct: Hattie Laveaux
Geol & Asst Supt: Jack Frank
Mech Eng: K L Colwell
NEVADA SCHEELITE MINE, Rawhide, undergr, WO_3
Mine Supt: Harry Manny
Prod: 140 tons
150-TON GRAV-FLOT MILL, at mine
Mill Supt: Mark Campbell

NEVADA SOILAID INC
P O Box 274, La Canada, Calif
Pres: R E Bartholomew
VP: Geo Bengston
Sec-Treas: Jean Bartholomew
VP, Chg of Prod & Gen Mgr: David E Gebhart
Gen Supt: H E Bodam
SOILAID, SULPHUR MINE, Box 340, Winnemucca, open pit, sulphur
Asst Supt: Phillip Hanson
MILL, Sulphur

NORTH STANDARD MNG CO
Box 605, Provo, Utah
Pres & Gen Mgr: Garth W Mansen
MINE, Tacoma dist, Montello, U_3O_8
Idle
(Idle)

NORTHERN RESOURCES CO
CAHILL MINE, Paradise Valley, 30 mi NE of Winnemucca, Poverty Peak dist, undergr, Hg
Supt: W W Brunkie
Idle

NOVIACK, J & BARNES, J F
1395 Mark Twain, Reno
SADDLE MINE, Humboldt County, undergr & open pit, WO_3, Au
Supt: J F Barnes
Under devel

PABCO PRODUCTS, INC
WHITE EAGLE MINE, Box 746 Henderson, open pit, gypsum
Supt: Glenn C Taylor
MILL, at mine

PETERSON, G A
Box 230, Mina
CEDAR CHEST, 28 mi E of Mina, undergr, WO_3
Prod: 5 tons
NEW POTOSI MINE, Candelaria, undergr, Pb, Ag, Au, Sb
Prod: 5 tons
Owners: G A Peterson & John Unwar
Gen Mgr: G A Peterson
Asst Gen Mgr: Harvey Hunter

PETERSON, M F & LORENA
Box 121, Tonopah
OLD COWGIRL MINE, 50 mi NE of Tonopah, undergr, Au, Ag
Under devel
M & M (MERCURY MTI MINE, 47 mi NE of Tonopah, undergr, Hg
(Optioned to Two States, Uranium Company, Bountiful, Utah)

PICK MNG CO
P O Box 174, Battle Mountain
FOX & SILVER CLOUD MINES, Elko County, Hg

PIOCHE MINES CONS, INC
Pioche
POORMAN, Lincoln County, Ag, Pb, Zn

RED HILL URANIUM CO
Box 587, Tonopah
Pres: L H Buhler
VP: Leon M Frazier
Sec-Treas: Nick J Barbarich
BLUEBIRD MNS, Tonopah, Box 1088, Pocatello, undergr
Gen Mgr: Jack C Turner
Gen Supt: W J Frank
Geol: L H Buhler
Under devel

RED ROCK QUICKSILVER MINE
Fish Lake Valley, Tonopah
Owner & Oper: W F Dunnigan
MINE, open pit, Hg
30-TON MILL, at mine
Idle

RIECK, H R & HOALST, BLAINE
Battle Mountain
SILVER CHIEF MINE, 8 mi NE of Battle Mt, undergr, open pit, Ag Pb, Au
Under devel

RIECK, H R & LAURITZEN
Battle Mt
OVERLOOK CLAIMS (6), 5 mi W of Battle Mt, undergr, surface, Co, Ni, Cu, Ag, Au
Under devel

ROBISON, SAM M & SON
Box 1288, Ely
Gen Mgr: Sam M Robison
Asst Gen Mgr: Donald M Robison
COLUMBIA & KEYSTONE MINE, 1 mi E of Ruth, undergr, surface, Zn, Pb, Cu, Au, Ag, Mn
ROBISON URANIUM MINES, Atlasa, U_3O_8
Under devel
EAGLE MINE, Lincoln County, 100 mi S of Ely, U_3O_8
Under devel
ROBISON MINES, 1 mi N of Ely, undergr, Zn, Cu, Pb, Ag
Under devel

ROCHESTER PLYMOUTH CO
Rochester via Lower
BUCK & CHARLIE MINE, Pershing County, Ag

ROSEGOLD PETROLEUM CORP
200 Davis St, San Francisco 11, Calif
Pres: John O Maberry
VP: M E Bohannan
Sec-Treas: Albert S Simrak
RABBIT HOLE MINE, Humboldt City, placer, Au

RUGGLES, A L & SONS
Cherry Creek
LAUGHING INDIAN GROUP, 3 mi S of of Cherry Creek in Egan Canyon, undergr, WO_3
Under devel

EXCHEQUER GROUP, 4 mi NW of Charry Creek, undergr & placer, Scheelite, Au, Ag
URANIUM CLAIMS, Telegraph mng dist
Under devel

SCANLON GOLD MNG CORP
130 S Virginia St, Reno
ARTFUL DODGER GROUP, Douglas County, Au

SEARCHLIGHT URANIUM CORP
Searchlight
BLOSSOM MINE, Clark County, Au

SHAW, CLARK C
662 Humboldt St, Fallon
CAMP TERRELL CLAIMS, 30 mi S of Fallon, Churchill County, Holy Cross dist, undergr, Ag, Au, Pb
CONCENT TABLE

J R SIMPLOT CO, FERTILIZER DIV
Box 912, Pocatello, Idaho
Gen Mgr: W Grant Kilbourne
SIMPLOT IRON MINE, 26 mi S of Pallisade, open pit, Fe
Mine Mgr: John Kobe
SIMPLOT SILICA PRODUCTS, INC Overton
Mgr: Keith Madsll
(See Idaho, Mont, Wye)

SISKON CORP
422 Gazette Building, Reno
Pres: H B Chessher, Sr
VP: E J Schrader
Sec-Treas: J E Chessher
AMERICAN EAGLE, GLOBE, OLD RELIABLE & PRINCE MINES
(See Aris, Calif)

SODAMILL CORP
Sodaville
150-TON FLOT-GRAV MILL
Supt: Kenneth Dunham

STANDARD SLAG CO
Box 3, Gabbs
Pres: L A Beeghly
VP: W E Bliss
Sec-Treas: W H Kilcawley
Western Mgr: R O Jones
GREENSTONE MINE, 2 mi E of Gabbs, surface magnesia
Supt: F W Reinmiller
Frm: A C Wood
Prod: 500 tons
300-TON GREENSTONE MILL, Gabbs, Calcining
Frm: W C Burnett
IRON MT MINE, Gabbs, open pit, Fe
Prod: 7,00 tons
Mine Supt: F W Reinmiller
Frm: G B Gaylord
MINNESOTA MINE, Yerington, open pit, Fe
Prod: 1,000 tons
Supt: J R Harmon
(See Ohio)

STORMY DAY MINE
65 State St, Reno
Pres: Fred M Anderson
VP: Sec: Albaun Bisio
Sec: Robert McDonald
STORMY DAY MINE, undergr, WO_3
Gen Supt: John H Uhalde
Prod: 45 tons

SUMMIT KING MINES, LTD
Box 632, Fallon
Pres: Ira B Joralemon
Gen Mgr: Percy G Dobson
Explor

SUNBURST URANIUM CORP
1075 NW Everett St, Portland 9, Oreg
MONARCH CLAIMS, Nye County, U_3O_8
(See Oreg, Utah)

SURDAY MNG CO, INC
1326 Pine St, Santa Monica, Calif
Pres & Gen Mgr: Frank C Fernandes
VP: Grover Bossert, Art Dellenger
Sec: Frank H Greve
Treas: Dr Chas Row
Purch Agt: Russ Carruthers
SUNDAY MINE, Box 889, Mina, 6 mi W of Marrieta, Mineral County, open pit, U_3O_8
Asst Gen Mgr & Supt: Geo Greve
Geol: Nelson Sweetzer
(See Frank C Fernandes, Calif)

TERTELING, J A & SONS
Contact
MARSHALL MINES, 1 mi W of Contact, undergr, Cu, Ag, Au
Mine Frm: Leo R Bricker
Prod: 40 tons

UHALDE LEASE
1275 Palisade Dr, Reno
Oper-Mgr: John H Uhalde
ALLADIN MINE, 20 mi SW of Elko, undergr, Pb, Ag, Cu
Prod: 20 tons
BONNE MINE, 20 mi SW of Elko, undergr, Cu, Ag
Prod: 15 tons

UNITED MINERALS CORP
518 Felt Bldg, Salt Lake City, Utah
Gen Mgr: G W Snyder, Jr
RIP VAN WINKLE, LUCKY STRIKE, TEMPLE TUNGSTEN, MONTE CRISTO MINES
(See Ariz, Utah)

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
EMPIRE MINE, Empire, surface, gypsum
Works Mgr: B Henry
LOVELOCK MINE, Lovelock, surface, perlite
(See Calif, Colo, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, N Mex, N Y, Ohio, Okla, Tex, Utah, Va)

U S LIME PROD CORP
Box 127, Henderson
Nev Mgr: John MacDonald
SLOAN MINE, Sloan, Box A, open pit, dolomite
Supt: Wm E Ellis
Frm: G Houchen
Prod: 300 tons
150-TON MILL, Sloan
Frm: Wm Beeler
APEX MINE, Box 508, N Las Vegas, open pit
Supt: C R Prince
Frm: John Sanger
Prod: 3,000 tons
250-TON MILL, Henderson
Supt: Wm B Mainor
(See Aris, Calif)

URANIUM EXPLOR & MNG CO
300 Freemont St, Las Vegas
(See Calif)

URANUS X MINES, INC
2806 Ona St, Boise, Idaho
Pres: Ernest Oberbillig
PYRAMID TUNGSTEN MINE, Contact open pit, WO_3
Idle

VESTALEE URANIUM & THORIUM CORP
Spanish Fork, Utah
PHALAN SHAFT, Boone Springs, undergr, U_3O_8, Th
Mgr: Lee W Southam
Supt: Wm C Lagod
Frm: Woodrow Pope
Eng: J H Wren
Prod: 5 tons
(See Utah)

WAH CHANG MNG CORP, LINCOLN MINES DIV
Gen Mgr: J J Strutmet, Jr
Asst Gen Mgr: George Reed
LINCOLN MINE, Tempiute, undergr, WO_3
Gen Supt: Ed Woods
Asst Gen Supt: John Russell
Purch Agt: Wm F Spain
Mech Eng: Charles Wilson
Met: Phil McGuire
Mine Supt: Al Nielson
Prod: 425 tons
700-TON GRAV-FLOT MILL, at mine
Supt: Allen Hunt
(See Calif, Colo, & E A Schoh & J H Cazier, Ariz)

WELCH, HUBERT
1738 Sparks St, Sparks
WELCH FLOURSPAR MINE, Adaven, 60 mi W of Pioche, undergr, CaF_2
Under devel

WHELCHEL MINES CO
1010 Arthur St, Caldwell, Idaho
Pres: William E Whelchel
VP: Ralph A Whelchel
Sec-Treas: Theresa M Whelchel
NATIONAL MINE, McDermitt, Au, Ag
Under devel

WHITE CAPS GOLD MNG CO
317 Clay Peters Bldg, 140 N Virginia, Reno
Pres: Carson Frasini
Sec-Treas: Walter Naftsmith
WHITE CAPS MINE, Manhatton, Au go, Hg
Gen Mgr: Hugh Cameron
Gen Supt: George Rounds
Geol & Met: Albert Silver
150-TON CYAN MILL, Manhattan

WOLFRAM CO, THE
Lovelock
NIGHTINGALE MINE, Nightingale dist, 60 mi SW of Lovelock, open pit & undergr, WO_3
Mgr: John M Heiser
TOULON MILL, 12 mi SW of Lovelock, Cras

WONDER MOUNTAIN MINES INC
130 3rd St, Las Vegas
Pres & Gen Mgr: L G Blakemore, 1873 1/2 Echo Park Ave Los Angeles 26, Calif
VP: J K Longworth
Sec: A M Blakemore
CAL-NEV-LEAD SILVER MINE, Pb, Ag
Under devel

YOUNG AND CRITCHLOW
1975 NW Everett St, Portland 9, Oreg
Own: James C Young, Kay Critchlow
COALDALE PROPERTY, Esmeralda County near Coaldale, undergr, U_3O_8
Idle

YUBA DIKE MINES, INC
P O Box 313, Pioche
Pres: John A Hedman
YUBA DIKE CLAIMS, Lincoln County, Ag

NEW HAMPSHIRE

FOOTE MINERAL CO
18 W Chelten Ave, Philadelphia 44 Pa
COLD RIVER MINE, Bellows Falls, at Cold Riv, undergr, feldspar
Gen Mgr: George Kneass, Jr
(See N C, Pa, Va)

WHITEHALL CO, INC
17 Battery Place, New York 4, N Y
Pres: A E Davison
Exec VP: Harry S Adams
VP & Purch Agt: P B Verplanck
Sec: Hyman D Lehrich
Treas: Robert J Eveleigh
RUGGLES MINE, Grafton, surface feldspar, mica, beryl, spodumene
(See Me)

NEW JERSEY

ALAN WOOD STEEL CO
Dover
Pres: H R Wood
VP: C E Davis
Sec-Treas: C L Jones
SCRUB OAKS MINE, Mine Hill, undergr, Fe
Supt: J P Kertis
Mine Frm: S J Usanowicz
Asst Mine Frm: K Sherlock
Eng: W McDougal
Prod: 3,500 tons
3,500-TON GRAV-MAGNETIC MILL, at mine
Supt: H K Karchmer
(See Pa)

AMER SMLTG & REFIN CO
Barber
PERTH AMBOY PLANT
Mgr: G H Weis
Gen Supt: C B Porter
(See Aris, Calif, Colo, Idaho, Ill, Kans, Md, Mont, Nebr, N Mex, N Y, Tex, Utah, Wash, & Federal Mng & Smelting Company, Mo)

NEW JERSEY ZINC CO, THE
160 Front St, New York 38, N Y
Ch of Bd: H Hardenbergh
Pres: R L McCann
VP, Mng & Explor: S S Goodwin
Mgr, Purch: W C Dunlap
MINES, Ogdensburg, Zn
Gen Supt: W P Evans
(See Calif, Colo, N Mex, N Y, Pa, Tenn, Va, Wis)

POROCEL CORP
Menlo Park
Pres: W W Gary
VP: A G Blake
Sec: W E Sawyer, Jr
Treas: C W Nielsen
Dir, Prod: T L Falkner
(See Ariz)

RICHARD ORE CO, SUBSID COLO FUEL & IRON CORP
Wharton
RICHARD MINE, near Wharton, undergr, Fe

Safety Eng: W P Galligan
Mech Eng: J J Burchko
Elec Eng: George Gawthorn
Elec Harry Martin
600-TON MAGNETIC MILL
Supt: P W Keim

SHANMOON INDUSTRIES, INC
MT HOPE MNG DIV
Box 392, Dover
MT HOPE MINE, undergr, magnetite
Gen Supt: Harold Christy
Ch Eng & Geol: Robert Hagerman
Office Mgr: Laurence James
Mine Capt: Howard Buckingham
Prod: 3,000 tons
1,500-TON FLOT MILL, at mine
Frm: Preston Davenport
Assay: Wooten J Bast
(See N Y)

UNITED CLAY MINES CORP
101 Oakland St, Trenton 6
Pres: B F Gentsch
VP & Gen Mgr: C W Lee
VP & Tech Dir: G W Phelps
Sec: K E Ward
Treas: O H Dilts
Operations Mgr: W L Rider
(See Fla, Ga, Md, Tenn, S C)

U S METALS REF CO
(Subsid of AMER METAL CO, LTD)
61 Broadway, New York 6, N Y
Pres: Hudge de Neufville
VP: E T Rose, L Cole, P H Dyke
W A Vogelstein, J Vuillequez, J Payne, Jr
Sec: T W Childs
Treas: H A Vogelstein
Purch Agt: D Kelliher
Control: H C Cohen
ELECTROLYTIC SMELTER & REFINERY, Carteret
Gen Mgr: Freeman H Dyke
Asst Mgr: Douglas Tennant
Prod: 150,000 tons Cu per year
25,000,000 oz Ag per year
600,000 oz Au per year
(See Amer Metal Co, Ltd, N Y)

NEW MEXICO

AMBROSIA MINERALS, INC
921 Simms Bldg, Albuquerque
Gen Mgr: R W Banta
LUCKY STRIKE NO 2 MINE, Socorro County, Mn
Supt: Cecil Porter

AMERICAN SMELTING & REFINING CO
SOUTHWESTERN DIVISION
813 Valley Nat'l Bank Bldg
Tucson, Arizona
Mgr: T A Snedden
Ch Geol: Kenyon Richard
GROUND HOG UNIT, Vanadium
New Mex, undergr, Pb, Zn
Supt: W C Waidler
DEMING MLG UNIT
600-TON FLOT PLANT
Supt: B L Rickman
(See Ariz, Calif, Colo, Idaho, Ill
Kans, Mont, Nebr, N J, N Y, Tex, Utah, Wash, & Federal Mng & Smelting Co, Mo)

AMERICAN URANIUM CORP
217 6th St, SW, Albuquerque
Pres: E T Chase
VP: Jay J Harris & Harry K Kling
Sec: B C Davis
Treas: C A Harris
Gen Counsel: Edward P Chase
MINE, Sandoval County, Cu
Prod: 1 car per day
LEASES, U_3O_8, V_2O_5
Gen Supt: Wm J Elam
Asst Supt: Asa Cody
Geol: Dale H Carlson
(See Ariz)

ANACONDA COMPANY, THE
NEW MEXICO OPERATIONS
Box 638, Grants
Mgr: Albert J Fitch
Asst Mgr: E C Peterson
Gen Mill Supt: W J Roberts
Asst Mill Supt: T R Beck, A K Veeder, W R Stern
Ch Met: Dale C Matthews
Asst Ch Met: J H Glover
Ch Geol: R D Lynn
Mine Supt: John P Herndon
Asst Mine Supt: Floyd Ballentine
Mech Supt: T M Fitch
Asst to Mgr: P S Cook
Ch Chemist: Jack B Pate
Ch Pilot: Woodrow B House
Ch Clerk: F G Holmberg
Asst Ch Clerk: George Hankinson
Storekeeper: R L Millard
Gen Frm, Crush & Handling Dept: Ames Leach
Supt, Acid Gen Plant: Wayne Hickson
Ch Elect: M D Barnaby
Frm, Jackpile Mine: B F Barlow, Stanley Whitty
Frm, Sections 9 & 33: A L Head
JACKPILE, NORTH JACKPILE, SECTION 9, ALTA, SECTION 33 MINES, undergr, open pit, U_3O_8
LEACHING PRECIP MILL, Bluewater
(See Calif, Idaho, Mont, Nev, N Y, Utah)

ATWOOD MINES, INC
c/o Ira L Moseley, Box 512, Lordsburg
ATWOOD MINE, Hidalgo County, Cu

AZTEC COPPER MINES INC
Santa Fe
COPPER MT PROPERTIES, Au, Mn

BANNER MINING CO
2042 Conner Stravenue, Tucson, Ariz
Pres: E S Bowman
VP & Gen Mgr: A B Bowman
Sec-Treas: James E Hogie
Purch Agt & Gen Supt: F M Bowman
BONNEY-MANILA & MISER'S CHEST MINES, Lordsburg, undergr, Cu Ag, Au
Mine Supt: Coleman Dunkerson
Mast Mech: Arthur B Smith
Prod: 300 tons
400-TON FLOT MILL, at mine
Mill Supt: Fred E Johnson
Assayer: Harold L Cox
(See Ariz)

BARRETT & SMITH MNG CO
801 Indiana, SE, Albuquerque
Own & Op: Frank A Smith
ROCKY FLAT NO 1 & 2 MINES, San Juan County, U_3O_8
Idle

BEACON EXPLOR & DEVEL CO
6500 Cochiti Rd SE, Albuquerque
Pres & Gen Mgr: Gerald W Hubbart, Jr
VP: Cass Sisler
Sec: Harold Wright
Asst Gen Mgr: Kenneth G Hubbart
BUCKEYE & SALMAR MINES, Water Canyon, Socorro County
undergr, open pit, Cu, U_3O_8, Au, Ag
Mine Supt: Don Collis
Mine Frm: Earl Shannon
Under devel

BEAR MT MANGANESE
1617 Alabama St, Silver City
Op & Gen Mgr: Eugene Bruell
BEAR MT MINE, Grant County, undergr, open pit, placer, Mn
Limited prod & under devel

BISHOP CANYON URANIUM CORP
Box 2016, Hobbs
Pres: Charles R Turner
VP: Harry E Coppin
Treas: Robert McPheron
(See Colo)

BLACK RANGE MNG CO
c/o J H Shoonmaker, Kingston
SILVER TAIL GROUP, Sierra County, Ag, Pb, Zn

BOSTON BICKET MINE
Box 12, Central
Lessee: Cesario F Holguin
MINE, Grant County, Au, Ag

BROWN & WALLACE
Aztec
BOBCAT MINE, U_3O_8
Gen Mgr & Supt: A R Wallace
Sec-Treas: Creighton Brown, 525 W Ave "C", Lovington

BUENA VISTA MNG & DEVEL CO
116 E Neal St, Socorro
BUENA VISTA MINE, Socorro County, Mn

CALUMET & HECLA, INC
Albuquerque
CLAIMS, Canoncito Indian Reservation, Ambrosia Lake, U_3O_8
Explor
(See Ill, Mich)

CAPITOL URANIUM CO
P O Box 1847, Farmington
Pres: Warren E Wiley
VP: Fred Carson
Sec-Treas: W A Pope, Jr
(See Ariz)

COLAMER CORP
Commerce Bldg, Grants
Pres: Frank Boylin
STATE NO 7 MINE, Valencia County, undergr, U_3O_8
Gen Supt: Kelsey Bolts
Under devel

COMPANION MNG CO
c/o J E Dietrich, Box 12, Pinos Altos
PORTLAND & 7 ADJOINING CLAIMS, Grant County, 3 mi NE of Pinos Altos, Cu

CUSTOM MNG CO
c/o Frank S Hall, Box 53
East Vaughn
CUSTOM MINE, Cu

D H A MNG CO
Dixon
AZTEC GROUP, Taos County, Cu
Supt: D H Abel

DOUBLE EARL CORP
Metropolis, Ill
Pres: Clarence A Faugh
MINE, Sierra County, Au, Ag
Mine Supt: G F Thorp, Kingston, N Mex

DUNCAN MNG CO
1107 W Glenrosa, Phoenix, Ariz
Part: B F Billingsley & R B Wilson
CONSOLATION MINE, Grant County, Mn

DUVAL SULPHUR & POTASH CO, POTASH DIV
Box 510, Carlsbad
Res Mgr: G E Attwood
Asst Res Mgr: J E Tong
Ch Eng: B G Messer
Safety Eng: H L Snively
Purch Agt: J R Smith
MINE, 21 mi E of Carlsbad, undergr, potash
Prod: 3,000 tons
Supt: J E Tong
Frm: J J Gasparich
FLOT MILL
Mill Supt: I B Phillips
Mill Frm: Wm Bourn
(See Tex)

ELAYER & CO
Box 1058, Silver City
LYNCHBURG MINE, Ag, Pb, Zn

FARRIS MINES CO
Box 647, Grants
Op: J F Farris
DAKOTO MINE, McKinley County, 6 mi NE of Prewitt, U_3O_8

FERRO IRON MINES, INC
c/o Attorney Brenton, Carrizozo
FERRO MINES, Lincoln County, Fe

FLORIDA MANGANESE, INC
115 W Hemlock St (P O Box 1001)
Deming
Pres: Carl M Loeb, Jr
Exec VP & Gen Mgr: Vincent M Ryan
Sec: Alan Nordlinger
Treas: Henry Loeb
Purch Agt & Asst Treas: F M Riddell
MANGANESE VALLEY MINE, 13 mi SE of Deming, undergr, Mn
Gen Supt: A C Melting
Geol: Harry Burgess
Mech Supt: Max R Myers
Mine Frm: Manuel Parra
Prod: 200 tons
MILL (See Yucca Mng Corp)

FOUR CORNERS EXPLOR CO
Box 116, Grants
Gen Mgr: F O Manol
Geol: Irving Rapaport
Geol, chg of Explor & Devel: Forrest Flinchér
Mng Eng: Robert Kirchman
Off Mgr: Clayton Langlais
PROPERTIES, Grants, Ambrosia Lake, U_3O_8
Explor
(See Colo)

FRAKA & PEABODY
Grants
KIOWA MICA MINE, Tres Piedras, mica
Under devel

FRAZIER DAVIS CONSTR CO
1319 Macklind Ave, St Louis 10, Mo
SECTION 23 MINE, SECTION 25 SHAFT, McKinley County, U_3O_8
Supt: William R Nash, 1404 San Carlos SW, Albuquerque

FRITZI MNG CO
Box 750, Silver City
Op: James Stuart, Bruce Leake
CONSOLATION MINE, Grant County, Mn

GAR PAC, INC
2419 S 5th St, Suite 11, Las Vegas, Nevada
Pres, Gen Mgr & Treas: Pace Foster
VP & Asst Gen Mgr: Garlin Davis
Sec: Stan Betty
Purch Agt: Ray Burgi
Office Mgr: Pat Foley
MINES, Truth or Consequences, N Mex, open pit & placer, Fe
Mech Eng: C A Linn
Met: Joe Linn
Prod: 100 to 300 tons
(See Ariz, Nev)

FERMIN GARRO CO
c/o Fermin Garro, 309 Park St, Socorro
HARDSCRABBLE MINE, Socorro County, 2 mi E of Magdalena, Pb, Cu

GIBRALTER MNG CO
Deming
Gen Mgr: H E McCray
HORNET MINE, Grant County, 6 mi W of Hachita, Pb, Zn

GILA MINES, INC
Box 1057, Silver City
Gen Mgr: A W Morehead
MINES, Grant County, 1 1/4 NW of Pinos Altos, Cu, Au, Ag

GRANTS MNG & LEACHING CORP
c/o G F Ingwersen, Box 364, Grants
MIRABEL MINE, Valencia County, Cu

GREAT EASTERN MINES
Craig Bldg, Albuquerque
SAN MIGUEL MINE, Sandoval County, Cu

GREAT LAKES CARBON CORP
Box X, Socorro
Pres: Geo Skakel, Jr
VP, Perlite Div: D L Martlett
Opr Mgr: K E Hazelton
BLANCA VISTA MINE, 4 mi W of Socorro, surface, perlite
Supt: Jerry Howell
Ch Geol: J W Reinhart
MILL, Socorro
(See Calif, Colo, Nev, Oreg)

HAILE MINES, INC
N MEX OPERATIONS
Box 37, Hillsboro
LAKE VALLEY MINE, 18 mi S of Hillsboro, undergr, Mn
Gen Mgr: James I Moore, Jr
Idle
40-TON HEAV-MED MILL
(See N Y)

HAYSTACK MT DEVEL CO, (A SUBSID OF SANTA FE RY CO)
80 E Jackson Blvd, Chicago 4, Ill
Pres: F G Gurley
VP: R G Rydin
Sec-Treas: C A Menninger
Purch Agt: F J Steinberger
HAYSTACK & POISON CANYON MINES, Prewitt, open pit, U_3O_8, V_2O_5
Ch Mng Eng: T O Evans
Sen Mng Eng: C E Stauder, Jr
Prod: 400 tons

HOBBS MNG & DEVEL CO
Box 1923, Hobbs
(See Colo)

HOLLY MINERALS CORP
340 Third St NW, Albuquerque
Pres: A H McRae
VP: E B Butts
Purch Agt: W M Davies
Gen Mgr: J G Heaston
MESA TOP, FLAT TOP, BEACON HILL MINES, 382 W Santa Fe, Grants, undergr, U_3O_8
Gen Mgr, Grants Oper: W A Palmer
Prod: 150 tons

HOMESTAKE-NEW MEXICO PARTNERS
(Gen Part: Homestake Mng Co
Limited Partners: United Western Minerals Co, J H Whitney & Co; White, Weld & Co, Rio de Oro Uranium Mines Inc, San Jacinto Petroleum Co, Clyde Osborn)
Grants
MINES (Rio de Oro), Ambrosia Lake, U_3O_8
750-TON CARBONATE LEACH PLANT, near Grants
Under construction

HOMESTAKE-SABRE-PINON PARTNERS
(Partners: Homestake Mng Co, Sabre-Pinon Corp)
Grants
MINES (Sabre-Pinon), Ambrosia Lake, U_3O_8
1,500-TON CARBONATE LEACH PLANT, 8 mi NW of Grants (Proposed)
Supt, Processing Dept: E S Allen

INTERNAT'L MINERALS & CHEM CORP, POTASH DIV
20 N Wacker Dr, Chicago 6, Ill
Pres Louis Ware
Exec VP J P Margersen
POTASH MINE, Carlsbad, undergr, KCl & K_2SO_4 products
Mgr E C Skinner
Gen Supt C E Pressnell
Geol Adolph Mitterer
Mine Supt M M Kartchner
Mine Eng: R H Lane
Prod: 13,000 tons
13,000-TON FLOT MILL, at mine
Mill Frm: Dean Owen
Ch Chem L E Dupont
(See Ariz, Colo, Fla, Ill, Me, Miss, N C, Ohio, S D, Tenn, Va, Wyo)

INTERNAT'L URANIUM CORP
Rt 1, Box 1524, Albuquerque
Pres & Gen Mgr Clifford Taylor
VP J Wilbur Jones
Sec Dr S T Harris
Treas Dr J A Rivas
Mine & Mill Supt Palmer Taylor
Geol Mark Whelan
BELIVIDERE MINE, open pit, Au, Cu, Ag
Prod: 100 tons
100-TON GRAV-FLOT MILL, at mine

ISLAND MESA URANIUM CORP
918 Simms Bldg, Albuquerque
Pres Mike Abraham
VP Oscar Abraham
Sec Star Parker

HUGH R ISTAEL CO
Box 478, Tyrone
ASTROLOGER MINE, Grant County, Burro Mt Mng dist, Pb, Ag, Au, Cu

KENNECOTT COPPER CORP CHINO MINES DIV
Hurley
Gen Mgr W H Goodrich
Asst Gen Mgrs E A Slover
J K Richardson
Div Purch Agt C N Dempsey
CHINO MINES, Santa Rita, open pit & undergr, Cu, Mo6
Mine Supt G J Ballmer
Asst Supt W E Herkenhoff
Mine Foreman K V N Harris
Mine Eng H A Wilmeth
Undergr oper Idle
FLOT MILL, Hurley
Mill Supt: E A Schroer
Asst Mill Supt F D Thayer
Mill Frm B C Jacobs
REVERB SMELTER, Hurley
Supt: W H Winn
Asst Supt W C Dow
(See Ariz, Nev, N Y, Utah)

KENNEDY & McGEE
c/o Red Rock Trading Post, Shiprock
Gen Mgr J S McGee
SALT CANYON MINE, San Juan County, U_3O_8, V_2O_5

KERMAC NUCLEAR FUELS CORP
(Owned by Kerr-McGee Oil Industries, Inc, Pacific Uranium Mines Corp, Los Angeles, Calif, Anderson Development Co, Albuquerque, N Mex)
4031 E 38th Ave, Denver 7, Colo
Mgr Mgn & Mtg V L Mattson
MINES, Grants, undergr, U_3O_8
Under devel
MILL (Proposed)
(See Colo)

KERR-McGEE OIL INDUS, INC, POTASH DIV
(Joint venture of Kerr-McGee, Phillips Petroleum Co, and Nat'l Farmers Union)
Grants
POTASH MINES, Eddy & Lea Counties, near Artesia
Under devel

KERR-McGEE OIL INDUS, INC, NAVAJO URANIUM DIV
P O Box 609, Shiprock
VP: A T P Seale
Mgr of Mng & Mtg: V L Mattson
Asst Gen Mgr: Jack Landon
Geol: Wayne Dolezal
MINE, undergr, U_3O_8
Gen Supt: Vernon Willden
Mine Shift Bosses: Blaine Byers
W Edmunds
Mine Eng: Billy Stevens
Prod: 100 tons plus
MILL, Shiprock
Mill Supt: A E Meyer
Asst Mill Supt: R E Shreve
Mill Frm: Floyd Jackson, Glenn Nofsinger, Al Cynova, Leo Carlton
(See Ariz, Colo, Okla, Wyo, and Kermac Nuclear Fuels, Colo, N Mex)

KINDOM URANIUM CORP
P O Box 441, Santa Fe
Gen Mgr John J Moya
KINDOM MOYA NO1 MINE, Santa Fe County, U_3O_8, Cu

LANDRUM, JOE
Box 1196, Silver City
CORLISS & JOE NO 2, Grant County, Mn

LARGO URANIUM CORP
(Subsid of FOUR CORNERS URANIUM CORP, Denver, Colo)
324 Simms Bldg, Albuquerque
Pres & Gen Mgr: Wesley Smith
DIAMOND NO 2 MINE, 1908 Gladden Ave, Gallup, undergr, U_3O_8
Geol: William D Tipton
Mine Supt: Wesley Smith
Prod: 75 tons

LA SALLE MNG CO
Box 217, Grand Junction, Colo
U_3O_8 Prod
(See Colo, Utah)

LEACH & LEACH
915 Grant St, Silver City
Part Francis I Leach, Albert A Leach
LADY FRANKLIN GROUP, Ag, Au, Mn
COLOSSAL-MIDNIGHT, Cu, Au, Ag
RESERVATION-MINNEAPOLIS, Au Ag, Pb
ALHAMBRA GROUP, U_3O_8, Ag, Ni, Cu
ALASKA GROUP, GOLDEN LINK GROUP, MALONE GROUP, Au, Ag Producing

LONE EAGLE MNG CO
2716 Ave "A", Carlsbad
LONE EAGLE MINE, Eddy County, Cu
Gen Mgr: J T Kimbrough

LONE STAR MNG & DEVEL CORP
235 Korber Bldg, Albuquerque
Pres W L Davidson
Sec-Treas: W C Oestreich
LA BAJADA MINE, Santa Fe Canyon, 40 mi NE of Albuquerque, 17 mi SW of Santa Fe, undergr, U_3O_8, Cu, Ni, Co
Mine Supt. C A Bowerman
Prod: 50 tons

LUCK MNG & CONSTR CO
Box 29, Silver City
Own & Gen Mgr G K Luck
BOSTON HILL MINE, Grant County, surface, Mn

LUREX MNG CORP
Box 1066, Silver City
Pres & Gen Mgr B R Flack
VP W Woodbury
Sec-Treas John D Flack
RIDGE NO 1, Animas, undergr, open pit, Mn
Gen Mgr John D Flack
Mine Frm: T B Jackson
Prod: 25 tons
100-TON GRAV MILL, at mine
Mill Frm: George Dunnagan

LEO MACK MNG CO
Carrizozo
LITTLE MACK MINE, Lincoln County, Au

MAGDALENA MNG & MLG CO
2040 S Navajo St, Denver 23, Colo
BLACK GOOSE, MANGUM, WESTON PROPERTIES, P O Box 236, Magdalena, 17 mi S of Magdalena, Mn
Gen Mgr R M Conrad
Under devel
(See Colo)

MAGNETITE PRODUCTS CORP
Capitan
Pres & Gen Mgr: Paul Brenton
MAGCO MINE, Lincoln County, Fe

MALCO EXPLOR CO, INC
(Formerly Uranium Corp of America)
Box 26, Los Alamos
Pres: Malcolm I Cole
VP: Bryan D Beck, Jr
Sec: James H Currie
Treas: Ben J Rogers
PROPERTIES, Coyote Area, Rio Arriba County, U_3O_8, V_2O_5
Explor
(See Colo, Utah)

MATHIS & MATHIS
P O Box 452, Silver City
IRON HEAD CLAIM & PEARSON PIT, near Pierro, Fe

McCOY & SUTTON
Box 522, Lordsburg
Op: Wayne Sutton

BUCKHORN MINE, Hidalgo County, 4 mi W of Lordsburg, Cu

McELVAIN BROS
220 Shelby St, Santa Fe
Part: T H & James McElvain
RED BLUFF 2, 4 & 7 MINES, Valencia County, U_3O_8

JAMES McGREGOR & CO
Box T, Tyrone
Gen Mgr James McGregor
ALHAMBRA MINE, Blackhawk Mng dist, Grant County, 18 mi W of Silver City, undergr, Ag, Cu, Ni, U_3O_8
Gen Supt: Berry Rothhammer
Mine Supt: Louis L Osmer, Jr
Under devel

MEADER CORP
c/o Carl Dodson, Mountainair
COPPER GIRL MINE, Torrance County, Cu

MERCURY URANIUM & OIL CO
c/o Ray C Wood, 617 Dakota SE, Albuquerque
SAN PEDRO MINE, Santa Fe County, New Placers Mng dist, Cu

MEX-TEX MNG CO, INC
Box 757, Socorro
Gen Mgr: Ben B Scott
ROYAL PLUSH MINE, Socorro County, Ag, Pb, Zn

MID-CONTINENT URANIUM CORP
P O Box 57, Grants
BARBARA J NO 1 MINE, 12 mi NW of Grants, undergr, U_3O_8
Gen Mgr Norman E Ebbley
Gen Supt Joseph F James
Geol Coy M Mobley
Prod: 50 tons
(See Colo, Utah)

MILLER, MURPHY, AND THOMPSON
P O Box 314, Cuba
Op: Obe C Thompson, A D Miller, V P Murphy
BUR NO 1 & 2 MINES, Sandoval County, Cu

MINERALS ENGR CO, PETACA OPERATION
Box 4295, Santa Fe
MICA MINE, 64 mi N of Santa Fe, Rio Arriba
Gen Supt Robert Hume
Purch Agt A Baca
Mine Supt C C Anderson
MILL, at mine
Mill Supt John Devaney
(See Colo, Mont)

MOLYBDENUM CORP OF AMERICA
Questa
Pres Marx Hirsch
VP E A Lucas
Treas: Wm B Kuntz
Gen Mgr A L Greslin
MOLY MINE, 7 mi E of Questa, undergr, Mo
Supt: Jose Varela
200-TON FLOT MILL
Supt. Robert Crel
(See Calif, Colo, N Y, Pa)

NACIMIENTO URANIUM MNG CORP
419 Central W, Albuquerque
Pres & Gen Mgr: Clinton O Bunn
VP: William E Binns
Sec-Treas. C R Hatfield
EXPLOR DRILLING, McKinley, Sandoval & Socorro Counties

NATIONAL POTASH CO
205 E 42nd St, New York 17, N Y
Pres & Treas. R C Wells
VP & Gen Mgr. T G Ferguson
VP: W B Porterfield
Sec: H L Pierson
Purch Agt: J A Browell
MINE, Carlsbad, undergr, potash
Mine Supt: R W Jenkins
4,000-TON FLOT MILL, Carlsbad
Mill Supt: G L Jordan
(See N Y)

NEW JERSEY ZINC CO, THE
160 Front St, New York, N Y
VP, Mng & Explor: S S Goodwin
Sec: Walter R Anyon
EMPIRE ZINC DIV
Western Mgr of Mines: P J Malott
Gilman, Colo
HANOVER MINE, undergr, surface, Zn, Pb, Hanover
Asst Supt: C C Snell
Idle
600-TON FLOT MILL
(See Calif, Colo, N J, N Y, Pa, Tenn, Va, Wis)

NEW MEXICO CONSOL MNG CO
Box 300, Silver City
KEARNEY MINE, Ag, Pb, Zn

NEW MEXICO COPPER CORP
Box 56, Carrizozo
Pres & Gen Mgr C E Degner
VP: John J Keel
Sec-Treas A D King
Met: R C Heath
Mech Eng: C E Degner, Jr
Elec Eng: D McDaniel
Mine Frm: G E King
CONQUEROR RIO TINTO MINES, 11 mi SW of Corona, Cu, Pb, Ag, CaF_2, Mn
Mine Frm: G E King
SURPRISE PARK MINES, 11 mi SE of Carrizozo, undergr, Cu, Ag, Pb, CaF_2, Mo
FLOT-GRAV MILL
Mill Supt: R C Heath
Asst Mill Supt E R Degner

ONEGO CORP, THE
Box 2024, Santa Fe
ELENA MARIA MINE, Santa Fe County, Au

OZARK-MAHONING CO, MNG DIV
P O Box 440, Tulsa 1, Okla
MINES, CaF_2
(See Colo, Ill, Ky, Okla)

PACIFIC URANIUM MINES INC
1924 White, Grand Junction, Colo
SECTION 24 & 26 MINES, Ambrosia Lake dist, U_3O_8
Ch Geol R L Redmond
Geol J H Volgamore, Jr, F D Miracle
Under devel
(See Colo)

PERU MNG CO
Box 300, Silver City
PEWABIC MINE, Ag, Pb, Zn
PERU MILL, at mine

PHELPS DODGE CORP
Tyrone
DEMRO MT BRANCH
Agt John F Stock
Explor
(See Ariz, N Y, Tex)

PHILLIPS PETROLEUM CO
Grants
SHAFT, Ambrosia Lake, U_3O_8
Under devel

POTASH CO OF AMERICA
Box 31, Carlsbad
Pres G F Coope
VP & Treas F O Davis
VP & Ree Mgr R G Haworth
Purch Agt. A H Beidel
Ind Rel Supt R H Blackman, Jr
Gen Supt. H N Clark
Cont W H Bartlett
MINE, 21 mi NE of Carlsbad, undergr, potassium chloride
Plant Eng R R Dabney
Safety Eng. R G Billings
Mine Supt R R Knill
Mine Frm. Neil Juhola
Mine Eng. E C Jourdan
Prod: 8,000 tons
8,000-TON FLOT MILL, at mine
Mill Supt. R E Smith
Asst Mill Supt E M Dale, Jr

PRIMARY ATOMIC MINERALS, INC
c/o Bernard Ziegelmeier, Pecos
Gen Mgr Edward J Purma
Gen Supt. R E Vandruff
VP: E L Rivers
HIGH PEAK NO 1 & 3 MINES, San Miguel County, U_3O_8

QUEEN GROUP MINE
Magdalena
Owner: Sadie Papa
MINE, Socorro County, Pb

RANCHERS EXPLOR & DEVEL CORP
214 Sunshine Bldg, Albuquerque
URANIUM EXPLOR, Ambrosia Lake

REY URANIUM CORP
Box 1236, Farmington
Pres & Gen Mgr: R J Scanlon
VP: W B Colbert
Sec: John R Mendius
(See Colo)

RIO DE ORO URANIUM MINES INC
215 Fourth St, SW, Albuquerque
Pres: W Rodney DeVilliers
VP: A B Willis
Sec: R F Deacon Arledge

Treas: E A Fuller
Purch Agt: Ray Reynolds
DYSART NO 1 MINE, Ambrosia Lake, undergr, U_3O_8
Gen Mgr: Ray Reynolds
Geol: John Q St Clair
Met: Clyde Osborn
Prod: 300 tons
IKE No 1, Ambrosia Lake, undergr, U_3O_8
Under devel
MILL (See Homestake - N Mex Partners)

ROGERS & SONS
Box 739, Shiprock
Pres: Joe Rogers
Treas: Robert Rogers
Part & Gen Mgr: Jody B Rogers
DENET MEZZ MINE, San Juan County, open pit, Cu
Mine Frm: Norman Henderson
Under devel

RUSSELL, CHARLES M
Tyrone
POCAHONTAS & JOY MINES, Grant County, Au, Ag, Cu

SABRE-PINON CORP
103 Bokum Bldg, Santa Fe
Pres & Gen Mgr: Hugh M Craigie
VP: Charles C Green, Jr
Sec: W L Leeds
Treas: W R Montgomery
AMBROSIA LAKE MINE, Ambrosia Lake, McKinley County, U_3O_8
(Under devel as Homestake-Sabre Pinon Partners)
PROPERTIES, Ambrosia Lake dist, & Mesa Gigante, Sandoval, & Bernalillo Counties
Explor
(See Colo)
CARBONATE LEACH PLANT
(Proposed)
(See Homestake-Sabre-Pinon Part)

ST ANTHONY URANIUM CORP
749 Main St, Grand Junction, Colo
EXPLOR & DEVEL, Valencia County, undergr, U_3O_8
(See Colo)

SEABOARD OIL & GAS CO
(See Subsid Socorro Uranium Corp)

SHIPROCK INDUSTRIES, INC
3825 Willat Ave, Culver City, Calif
Pres: John F Sullivan
VP: O J Lilly
Sec-Treas: L B Chandler
MINE, Box 185, Farmington, Sanastee dist, undergr, U_3O_8
Gen Supt: Rowland D Young
(See Colo)

SOCORRO URANIUM CORP
(Wholly owned subsid of Seaboard Oil & Gas Co)
417 1st Nat'l Bank Bldg, Albuquerque
Gen Mgr: D Wright
Geol: Melvin Bowles
JETER MINE (CHARLIE NO 2), P O Box 253, Belen, Socorro County, open pit, U_3O_8, V_2O_5
Mine Supt: C Wright
Prod: 75 tons
(See Colo, and Seaboard Oil & Gas Co, Tex)

SOUTH PEAK MNG CO
P O Box 833, Aztec
Gen Mgr: Charles Riecke
ENOS JOHNSON NO 3 MINE, San Juan County, U_3O_8, V_2O_5

SOUTHWEST POTASH CORP
(Subsid of AMERICAN METAL CO, LTD)
61 Broadway, New York 6, N Y
MINE, Box 472, Carlsbad, 22 mi NE of Carlsbad, undergr, potash
Gen Mgr: W Aubrey Smith
Asst Gen Mgr: Victor Zandon
Plant Eng: Dale L Schrader
Purch Agt: A H Kunkel
Mine Supt: John Sowers
Mine Eng: Ira Herbert
Prod: 4,000 tons
4,000-TON FLOT MILL, at mine
Mill Supt: J Frank Henderson
Asst Mill Supt: George Marts
Ch Chem: H S Kaplan
(See American Metal Co, Ltd, N Y)

STAR MINES
602 W 13th St, Silver City
Pres & Gen Mgr: David D Osmer
MORNING STAR MINE, undergr, placer, WO_3, Bi
Mine Supt: Louis L Osmer, Jr
Prod: 10 tons
24-TON GRAV MILL, at mine

STEEPLEROCK EXPLOR SYN
Duncan, Ariz
Supt: J A Park
EAST CAMP GROUP, Grant County, Ag, Pb, Zn
STEEPLEROCK MINE, Grant County, Au, Ag

STRONG & HARRIS, INC
Box 137, Vanadium
Pres: Earl Strong
EL CAMPO & SWEET HOME MINES, Grant County, Mn

SUPER MNG CO
c/o 923 Copper NW, Albuquerque
MINE, Sierra County, Pittsburg Mng dist, Pb

TAOS MINERALS CO, INC
Box 585, Taos
Pres: W B Evans
VP: Lloyd Evans, Paul M Walker
Sec-Treas: James E Coad
Gen Mgr: Max A Evans
Geol: Daniel B Hurley
Mine Supt: Arthur Cresswell
MINES, Twining, Red River, Bitter Creek, Cabresto Canyon, Picuris, all in Taos County, undergr, open pit, Cu U_3O_8, perlite, rare earths
Under devel

TEJANO MNG CO
Box T, Tyrone
Own & Gen Mgr: James McGregor
AUSTIN-AMAZON MINE, 10 mi W of Tyrone in Burro Mts, undergr, open pit, Cu, U_3O_8, Au, Ag
Gen Supt: Berry Rothhammer
Geol: E V Reinhardt
Mine Supt: Louis L Osmer
Asst Mine Supt: John Jeffus
Mine Frm: Robert Cloudt
Prod: 1,000 tons

THOMPSON, WARREN BARRY
P O Box 1827, Denver, Colo
AJAX & LITTLE WONDER MINES, Colfax County, undergr, Au, WO_3
(See Utah)

TORRES, J D
Magdalena
MISTLETOE MINE, Socorro County, Ag, Pb, Zn

TROY ROSE MNG CO
Shiprock
KINGS NO 6 & HARVEY HEAVY NO 3 MINES, San Juan County, U_3O_8
Gen Mgr: Troy Rose
Idle

TRUJILLO & GERARD CO
Box 1005, Espanola
Op: S L Gerard, Albert Trujillo
HIDDEN TREASURE MINE, Rio Arriba County, Petaca Mng dist, mica

UMINO CO
c/o Polo Armijo, Jr, 516 Reservoir, Socorro
LITTLE DAVY MINE, 11 1/2 mi E of San Antonio, N Mex, U_3O_8
Gen Mgr: Kenneth E Koger
Gen Supt: R V Roden

UNION GULF OIL & MNG CORP
2701 U S Hwy 50, Grand Junction, Colo
CLAIMS, Socorro County
(See Colo, Utah)

UNITED DEVEL CO
Box 551, Dumas, Texas
CASTILLO LEASE, Mora County, Cu

U S BORAX & CHEMICAL CORP, U S POTASH CO DIV
Carlsbad
Res Mgr: Earl H Miller
Asst to Res Mgr: D L Libbey
Purch Agt: R D Schenck
MINE & REFINERY, 21 mi E of Carlsbad, potash
Mine Supt: John S Wright
Refinery Supt: George R Bowland
(See Calif, N Y)

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
MINE, Grants, open pit, perlite
Works Mgr: W T Tuschek
(See Calif, Colo, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Y, Ohio, Okla, Tex, Utah, Va)

UNITED WESTERN MINERALS CO
136 W Palace Ave, Santa Fe
Pres: Alva A Simpson, Jr
VP: Norman S Dike
Sec-Treas: Herbert A Holt
SEC 32, T-14N, R-8W, Ambrosia Lake, undergr, U_3O_8
Gen Mgr: Donald E McLaughlin
Gen Supt: Clyde Osborn
Geol: J W Patterson
Prod: 400 tons daily (last half 1957)
(This section owned by Homestake-New Mexico Partners)
SEC 30, T-14N, R-9W, Ambrosia Lake, undergr, U_3O_8
Operators: San Jacinto Petroleum Corp
Prod: 400 tons daily (last half 1957)
(This sec jointly owned by United Western Minerals, J H Whitney & Co, White, Weld & Co, San Jacinto Petroleum Corp)
SEC 22, T-14N, R-10W, Ambrosia Lake, undergr, U_3O_8
Operators: Kerr-McGee Oil Industries, Inc, Kermac Nuclear Fuels
Prod: 400 tons daily (last half 1957)
(This sec jointly owned by Kerr-McGee Oil Industries, United Western Minerals Co, J H Whitney & Co; White, Weld & Co; San Jacinto Petroleum Corp)
750-TON CARBONATE LEACH PLANT, near Grants
(Under construction by Homestake-New Mexico Partners)
(See United Western Minerals, Utah)

UTCO URANIUM CORP
310 1st Nat'l Bank Bldg, Denver, Colo
JEETER MINE, Socorro County, open pit
Gen Mgr: Mason Rankin
Asst Gen Mgr: Donald Wright
Prod: 100 tons
(See Ariz, Utah)

VANADIUM CORP OF AMER
Durango, Colo
Dir: Page Edwards
PLOT NO 3, 4, 7 & SHADYSIDE NO 1, 2 MINES, San Juan County, U_3O_8, V_2O_5
(See Ariz, Colo, N Y, Utah)

VERMILION CLIFFS MNG CORP
Box 1637, Flagstaff, Ariz
Pres: C E Knowles
VP: R E Darling
Sec-Treas & VP of Oper: Allen C Tester
SLATE, SILVER KING & RIO GRANDE MINES, Bayard Dist, N Mex, undergr, Pb, Zn
Mine & Gen Supt: Ray Holmquist
Mine Frm: Urbano Chacon
Prod: 75 tons
(See Ariz)

VISTA MNG CO
2908 Hyder Ave SE, Albuquerque
ST LUKE MINE, Santa Fe County, Cu

VITAL MINERALS INC
1020 Mills Bldg, El Paso, Tex
OLD BUENA VISTA MANGANESE MINE, Socorro, South end of Magdalena Mts, undergr, open pit, Mn
Gen Mgr: Geo E McKenzie, El Paso
Geol: C E Burbridge, Jr, El Paso
Prod: 500 tons
500-TON HEAV-MEDIA MILL, 25 mi SW of Socorro, at mine

VOGEL URANIUM MINE & EXPLOR CO
c/o Harold W Vogel, 80 Western Ave, Amarillo, Tex
MIKIE V NO 2, 5, 7 MINES, San Miguel County, Tecolite Mng dist, U_3O_8, V_2O_5, Cu

WERNER LAKE NICKEL MINES LTD
311-200 Bay St, Toronto, Ont, Canada
Pres: R C C Henson
VP: H W Norrington
Sec-Treas: G E Kennedy
HENRY CLAY MINE, P O Box 546, Lordsburg, Cu, Au, Ag
Gen Mgr: Murray Watts
Geol: A Mahaler
Under devel

WESTERN MINES, INC
Box 1301, Santa Fe
Pres: W E Scorah
BOTTOM DOLLAR, PENNSYLVANIA, TOM PAYNE & DUMP MINES, Santa Fe County, Ag, Pb, Zn

YACOMA INC
Box 785, Lordsburg
Mgr: L Yacoma
CARLISLE GROUP, Grant County, Au
MANGANESE CHIEF MINE, Socorro County, Mn

YUCCA MNG CORP
115 W Hemlock St (P O Box 1001), Deming
Pres: Carl M Loeb, Jr
Exec VP & Gen Mgr: Vincent M Ryan
Sec: Alan Nordlinger
Treas: Henry Loeb
Purch Agt & Asst Treas: F M Riddell
300-TON GRAV HEAV-MED MILL &
KILN, 11 mi SE of Deming
Mill Supt: Roy L Hicks
Mill Frm: Joe L Murphy
Assay: A F Hallett
(See Florida Manganese, Inc, N Mex)

YUCCA URANIUM, INC
1115 Fourth St NW
Albuquerque
Pres & Gen Mgr: Melvin E Richards
VP: Lindsey J Green, Jr
Treas: William S Horabin
YUCCA NO 2 MINE, Grants, open pit,
Geol: John Brady
Under devel

ZUNIGA MINES, INC
Box 601, Silver City
Pres: Douglas B White
VP: Earl Strong
Sec-Treas: Frank Light
ZUNIGA MINE, near Pierro, Grant County, surface, Cu
Prod: 100 tons
LEACHING MILL, at mine

NEW YORK

ALLIED CHEM & DYE CORP, GEN CHEM DIV
40 Rector St, New York 6
Pres: C M Brown
Mgr: R H Dickson
Asst Mgr, Mng Oper: W J Tropp
Dir, Purchases: F J Prency
(See Colo, Mo, Va)

AMER AGRI CHEM CO, THE
50 Church St, New York 7
Pres: C M Powell
VP: B R Richey
Sec & Treas: Hughes Mayo
Purch Agt: G E Campbell
(See Fla)

AMERICAN CYANAMID CO
30 Rockefeller Plaza, New York
Pres: K C Towe
VP: R B Fiske, E D Powers, W G Malcolm, R C Swain, G R Martin, S C Moody, L C Perkinson
Treas: G C Walker
Sec: R S Kyle
(See Ark, Fla, Ga, Va)

AMERICAN MACH & METALS, TROUT MNG DIV
233 Broadway, New York 7
Chm of Bd: John C Vander Pyl
Pres: Charles W Anderson
VP: I Newton Backer, John S Swennumson, Ambrose E LeVan
Comptroller: Glenn A Swennumson
Sec: Alphonse Kenison
Asst Sec: Roy F Stachel, Henry C Deofe
Treas: Robert G Burns
Asst Treas: Harry C Anderson, Albert L Ewing
Asst Sec & Treas: Patricia A Harrington, William H Behrens
(See Mont)

AMERICAN METAL CO, LTD, THE
61 Broadway, New York 6
Chm of Bd: Harold K Hochschild
Pres: Walter Hochschild
VP & Sec: Thomas W Childs
VP & Control: Herbert S Cohen
VP & Treas: Hans A Vogelstein
VP: Hugo de Neufville, John Payne, Jr, Ernest T Rose, Jean Vuilleque
(See Pa, U S Metals Ref Co in N J & Southwest Potash Corp in N Mex & N Y)

AMERICAN SMLTG & REFIN CO
120 Broadway, New York
Ch of Bd: Roger W Straus
Pres: K C Brownell
Ch of Fin Com: J C Emison
Exec VP: R W Vaughan
VP: R D Bradford, A A Brown, F H Eichler, J D MacKenzie, A J Phillips, S D Strauss, F Walker
VP & Treas: O S Straus
Sec: Harold Howe
Mgr, Ore Purch Dept: R L Jourdan
MINING DEPT
Asst To VP: D J Pope
Res Engs: V I Mann, C E Nelson
Expl Mgr: C P Pollock
Ch Geol: L H Hart
PURCHASING DEPT
Dir: F H Eichler
TRAFFIC DEPT
Gen Tr Mgr: F L Merwin
(See Ariz, Calif, Colo, Idaho, Ill, Kans, Md, Mont, Neb, N J, N Mex, Tex, Utah, Wash & Federal Mng & Smelting Co, Mo)

ANACONDA CO, THE
25 Broadway, New York
Ch of Exec Com: Cornelius F Kelley
Ch of Bd: Roy H Glover
Pres: Clyde E Weed
Exec VP: Edward S McGinnis
VP, Mng Oper: Richard S Newlin
VP, Met Oper: Russel B Caples
VP, Western Oper: Chester H Steele
VP & Comptroller: W Kenneth Daly
VP: Thomas A Campbell, Vincent D Perry
Sec & Treas: C Earle Moran
Asst Sec: Jeremiah D Murphy
Asst Sec & Asst Treas: David R Nelson, Thomas E Conrad, Ralph E Schneider
Asst Controller: Harry C Barteau, William E Quigley
Ch Geol: V D Perry
Consult Geol: R H Sales
Dir Mng Eng Research: E R Borchardt
Gen Traffic Mgr: R Q Erichson
(See Calif, Idaho, Mont, Nev, N Mex, Utah)

BARTON MINES CORP
N Creek, Warren County
Pres: H H Barton
VP & Mgr: H M Vogel
Sec & Prod Mgr: C R Barton, Jr
Gen Frm: Howard Waldron
Purch Mgr: T Leonard, Jr
Cont: J B Burns
Met: William Elting
MINE, near North Creek, open pit, garnet
Mine Supt: S Brown
Prod: 400 tons
400-TON GRAV-FLOT-HEAV-MED MILL, at mine

BESTWALL GYPSUM CO
120 E Lancaster Ave, Ardmore, Pa
Pres: Rawson G Lizars
Exec VP: P E Pischer
VP, Comptroller & Treas: J R Johnston
Sec: Arthur O Graves
Asst Sec & Asst Treas: J L Strickland
Purch Agt: J I Trolley
MINE, Clarence, undergr, gypsum
Gen Mgr: H F Dobo
Asst Gen Mgr: M M Powers
Mech Eng: B Greenback
Mine Supt: W Lotz
Prod: 750 tons
750-TON MILL, Akron
Mill Supt: J Carpenter
(See Iowa, Ky, Mich, Tex, Utah)

CALERA MNG CO
730 5th Ave, New York 19
Pres: H N Sloan
Exec VP: E C Roper
VP: H A Pearce, V H Clarke
Sec-Treas: W T Holmes
(Subsid of Howe Sound Co)
(See Idaho, Utah)

CALLAHAN ZINC-LEAD CO
100 Park Ave, New York 17
Pres: J T Nail
VP: R F Mahoney
Sec-Treas: E A Sale
(See Colo)

CAMP BIRD LTD
70 Pine St, New York 5
Ch: John Dalgleish
Cons Eng: C Maxwell Norman
Sec: Ian Whyte
(See Colo)

CERRO de PASCO CORP
300 Park Ave, New York 22
Pres: W P Hannig
VP: H D Starr, A R Mees, A H Engelhardt
Sec: M D Davis
Treas: H D Starr
Purch Agt: D A Bancel
Cont: W B Devlin
Ch of Bd: P F Russell
Operations in Peru

CLIMAX MOLYBDENUM CO
500 Fifth Ave, New York 36
Pres: A H Bunker
VP: W G Thomas
Sec: L A Cowan
Treas: Wallace Macgregor
(See Calif, Colo, Pa)

CLIMAX URANIUM CO
Subsid of CLIMAX MOLYBDENUM CO
500 Fifth Ave, New York 36
Sec: L A Cowan
Treas: W Macgregor
(See Ariz, Colo, Utah)

CLINTON MET PAINT CO
Clinton
Pres & Treas: Bruce M Bare
Sec & Purch Agt: Mrs C K Covell
MINE NO 3, Clinton, undergr, iron oxide
Gen Supt: Robert Barry
40-TON MILL, Franklin Spr
Mill Supt: Ray Chrysler

COLD SPRING TUNGSTEN, INC
1036 1st Natl Bank Bldg, Denver 2 Colo
Pres: Boris Preigel
VP: Alexander Preigel
Sec: Paul Newton
Treas: Wm Rosenblatt
Purch Agt: C W Ellin
(See Colo)

COLORADO RESOURCES, INC
50 Broad St, New York 4
Pres: Andrew T Geyer, Sr
VP: Mike Hildreth
Sec: Mrs Phaen Baker

CONSOL COPPERMINES CORP
405 Lexington Ave, New York 17
Pres: Chester D Tripp
VP: Claude F Leaman
VP & Treas: Charles L Steeger
Sec: E J A Tombrinck
(See Nev)

COPPER CITIES DIV MIAMI COPPER CO
61 Broadway, New York
Pres: E H Westlake
VP: J H Folliott
VP & Treas: J M Greenburgh
Sec: Henry Kaufman
Purch Agt: R L Beals
(See Ariz & Miami Copper Co, Ariz & N Y)

EMPIRE STAR MINES CO, LTD
300 Park Ave, New York 4
Pres: J R Mann
Sec: John E D Grunow
Treas: Walter P Schmid
Gen Mgr: H R Gittpatrick (Calif)
Purch Agt: Wm Carmen
(See Calif)

FREEPORT SULPHUR CO
161 E 42nd St, New York 17
Pres: Langbourne M Williams
Ch, Exec Comm: C A Wight
VP: G B Moran, R C Hills, H L Pierson
(See La, N Mex & Nat'l Potash Co, N Y)

GOUVERNEUR TALC CO, INC
c/o R T Vanderbilt Co, 230 Park Ave, New York 17
Pres: F B Vanderbilt
Sec: H B Vanderbilt
Treas: F C Goss
Purch Agt: K J Miles
VANDERBILT MINE, Balmat, undergr talc
VP & Gen Mgr: R S McClellan
Mine Supt: J Bulgar
Frm: Leon Typhair
Mine Eng: Geo Erdman
Prod: 350 tons
500-TON DRY GRIND PLANT
Mill Supt: Howard Adam

HAILE MINES, INC
500 Fifth Ave, New York 36
Pres: W Lunsford Long
VP: Hewitt S West, Jr, Frederick McConagie
VP & Sec: Charles R Skinker
Asst Sec: Joan M West
Treas: Joseph P Wilmott
(See N Mex)

HOWE SOUND CO
730 Fifth Ave, New York
Ch of Bd: Reeve Schley
Pres: H H Sharp
Exec VP: E Cecil Roper
VP, Met & Const: Hubert A Pearse
VP, Mng: Vinton B Clarke
Sec & Treas: William T Holmes
Asst Sec & Asst Treas: Gordon C May
(See Wash & Calera Mng Co, Idaho, Utah)

INDUSTRIES & MINES, INC
80 Broad St, New York 4
Pres: Martin Lasher
VP: Harry Javits
Sec: Miss P V Frankel
Treas: Max Grossman
Purch Agt: M Lasher
(See Utah)

INSPIRATION CONSOL COPPER CO
25 Broadway, New York 4
Pres: R S Newlin
VP & Gen Mgr: P D I Honeyman
VP & Sec: H M Jacob
Treas & Asst Sec: E F Wendt
Purch Agt: A B Harris
(See Ariz)

INTERNAT'L SALT CO, INC
Retsof
RETSOF MINE, 4 mi S of Geneseo
undergr, rock salt
Gen Mgr: T F Courthope
Purch Agt: J A Cooney
Pl Mgr: S Martin
Mech Eng: R Goetz
Elec Eng: D L Moynes
Prod Frm: J J Riordan
Mine Frm: Lawrence Teter
Mine Eng: Chester Truax, Jr
Prod: 4,000 tons
(See Pa)

JOHNS-MANVILLE SALES CORP
22 E 40th St, New York 16
Ch, Bd: L M Cassidy
Pres: A R Fisher
VP: K W Huffine
Sec: H M Ball
Treas: R Hackney
Purch Agt: W J Reynolds
(See Johns-Manville Products Corp, Calif)

JONES & LAUGHLIN STEEL CORP, NEW YORK ORE DIV
Star Lake
BENSON MINES, 32 mi E of Gouverneur, open pit, Fe
Mgr: R G Fleck
Asst Mgr: A F Peterson, Jr & M O Peterson
Ch Mng Eng: E M Smoky
Pl Met: E A Eastman
Res Eng: Carl Djuvik
Ch Acct: A R Eshbach
Geol: F J West
Inc Eng: F D Woodworth, Jr
Gen Frm, Pit: W P Bach
Gen Frm, Conc: W A Vickers
Gen Frm, Sinter: R W West
Gen Frm, Maint: P L VerSteeg
Ch Elec: R F Peterson
Safety Supt: C LaDuke
Prod: 15,000 tons crude
5,000 tons concentrate
GRAV & MAGNETIC SEPARATOR MILL, at mine
SINTER PLANT, at mine
(See Mich, Minn, Pa)

KENNECOTT COPPER CORP
161 E 42nd St, New York 17
Pres: C R Cox
VP, Explor: James Boyd (Bear Creek Mng Co)
VP, Research: Leslie G Jennese
VP: Frank R Milliken
Sec: Paul B Jessup
Treas: E S Hann
Compt: G B Russell
Dir, Eng: F W Chambers
Dir, Ind & Pub Rel: A S Cheroany
Counsel: S S Jackson
Gen Purch Agt: L W Shelton
Gen Traffic Mgr: R E Taylor
(See Ariz, Nev, N Mex, Utah)

MANGANESE, INC
500 Fifth Ave, New York 36
Pres: W Lunsford Long
Exec VP: Hewitt S West, Jr
VP, Charge of Oper: F A McConagle
Sec: Charles R Skinker
Treas: J F Wilmott
(See Nev)

MERCURY & CHEMICALS CORP
342 Madison Ave, New York 17
Chm of Bd: Bernard J Chabot
Pres: Richard P Fischer
VP & Sec: E Haring Chandor
Treas: George Ornstein
(See Oreg)

MIAMI COPPER CO
61 Broadway, New York 6
Pres: E H Westlake
VP & Treas: John G Greenburgh
VP: J H Folliott
Sec: Henry Kaufman
(See Ariz & Copper Cities Div, Ariz & N Y)

MOLYBDENUM CORP OF AMERICA
500 Fifth Ave, New York
Pres: Marx Hirsch
Exec VP: Emil A Lucas
Sec: James S Crawford
Treas: William B Kinzs
(See Calif, Colo, N Mex, Pa)

NAT'L GYPSUM CO
325 Delaware Ave, Buffalo 2
Ch, Bd of Dirs: M H Baker
Pres: F A Manske
Sr VP: W F Anderson & J W Brown
Sec: D R Littlewood
Treas: W S Corrie
Purch Agt: E T Obeschain
MINE, Clarence Center, gypsum
Pl Mgr: E J Killian
Mine Supt: Lloyd Lyle
Prod: 1,500 tons
(See Ind, Iowa, Kans, Mich, Ohio, Pa, Tex, Va)

NAT'L LEAD CO
111 Broadway, New York 6
Pres: Joseph A Martino
VP: Alfred H Drewes, Frank J Koegler, David A Mersen, Joseph H Reid, Herman T Warshow, William J Welch, Harry C Wildner
Sec: John B Henrich
Treas: Joseph J Moreman, Jr
Comptroller: George A Denny
TITANIUM DIV MINE, Tahawus, Essex County, ilmenite, magnetite
(See Ark, Calif, Kans, La, Mo, Mont, Nev, Tenn, Tex, Wyo)

NAT'L POTASH CO, SUBSID OF FREEPORT SULPHUR CO & PITTSBURGH CONSOL COAL CO
200 E 42nd St, New York 17
Pres: R C Wells
VP: T C Ferguson & W B Porterfield
Sec: H L Pierson
(See N Mex)

NEW JERSEY ZINC CO, THE
160 Front St, New York 38
Pres: R L McCann
VP, Mng & Explor: S S Goodwin
Treas: Samuel Riker, Jr
Purch Agt: W C Dunlap
(See Calif, Colo, N J, N Mex, Pa, Tenn, Va, Wis)

NEW YORK & HONDURAS ROSARIO MNG CO
120 Broadway, New York 5
(See subsid Rosario Explor Co, Colo & N Y)

NEWMONT MNG CORP
300 Park Ave, New York 22
Pres: P Malozemoff
VPs: M D Banghart, R C Bonebrake
Sec: Carroll Searle
Treas: W T Smith
Purch Agt: H W Volkman
Control: W P Schmid
(Wholly owns Resurrection Mng Co, Colo; has operating interest in Idarado Mng Co, Colo)

NORBUTE CORP
393 Madison, New York 17
Pres: Nicolas M Salgo
Sec: H Newman Clarke, Jr
Treas: Ralph W LaBaume
(See Utah)

PHELPS DODGE CORP
300 Park Ave, New York 22
Ch of Bd: L S Cates
Pres: R G Page
VPs: C E Dodge, G R Drysdale, J M Hawkins, C R Kuzell
Asst VP & Sec: J E Mastog
Compt: J M Hawkins
Asst Compts: K A Lawrence, A P Peterson
Treas & Asst Sec: M W Urquhart
Asst Sec-Treas: R D Barnhart
Asst Sec-Treas: H R Dobbs
Gen Purch Agt: P G Lee
Gen Traffic Mgr: J W Lee
Asst Gen Traffic Mgr: B Pesseta
Consident Eng of Mines: H Z Stuart
(See Ariz, N Mex, & Phelps Dodge Ref Corp, N Y & Tex)

PHELPS DODGE REF CORP, SUBSID OF PHELPS DODGE CORP
300 Park Ave, New York 22
Chm of Bd: Walter C Bennett
Pres: C S Harloff
VP: Howard Barkell, C H Winship, Jr C E Dodge
Sec: J B Beaty
Treas: M W Urquhart
Purch Agt: P G Lee
Asst Treas: H R Dobbs, R D Barnhart
Compt: J M Hawkins
LAUREL HILL REF & SMLTR,
Laurel Hill, Cu, S, Ni, Selenium, Tellurium
Pl Mgr: F W Richardson
(See Tex, Phelps Dodge Corp, Ariz, N Mex)

PITTSBURGH CONSOL COAL CO
(See Natl Potash Co)

RAMAPO URANIUM CORP
Warwick
Pres: Sidney Lieberman
MINE
Under devel

REPUBLIC STEEL CORP
Republic Bldg, Cleveland, Ohio
OLD BED, HARMONEY & FISHER HILL MINES, Mineville, undergr, Fe
Mgr: F J Myers
Supt: J R Brennan, Sr, J R Murphy
Engr: W A Blometran
Maint Supt: J R Brennan, Jr
Ch Eng: A K McClellan, Jr

Prod: 2,000,000 tons per year
CHATEAUGAY MINE, Lyon Mt, undergr & surface, Fe
Mgr: W G Crusberg
Supt: Joe Tolosky, Sr
Ch Eng: P J McMenamin
Maint Supt: Howard Pigg
Elec: Peter Daniels
Prod: 1,250,000 tons per year
CHATEAUGAY MILL, magnetic
Supt: J R Tolosky, Jr
Ch Chem: J M Scott
Prod: 385,000 tons conc per year
(See Ala, Mich, Minn, Ohio)

RESURRECTION MNG CO
Subsid of NEWMONT MNG CORP
300 Park Ave, New York 22
Chm of Bd: Fred Searls, Jr
Pres: Plato Malozemoff
Sec: W F Schmid
Purch Agt: F R Bochatay
(See Colo & Newmont Mng Corp, N Y)

REYNOLDS MINERALS CORP
27 William St, New York
Pres: Douglas J Luckhurst
VP: G C Ridland
Sec: Joseph Mascuzzi
Treas: Robert J Stiro
(See Colo)

ROSARIO EXPLOR CO
Subsid of NEW YORK & HONDURAS ROSARIO MNG CO
212 Electric Bldg, New York
Pres: R M Reisinger
VP: H I Altshuler
Sec-Treas: G E McDaniel
Geol: Warren E Ove
Explor only
(See Colo)

RUTILE MNG CO OF FLA
111 Broadway, New York 6
Pres, Charles C Morris, Jr
VP: John Ross
Sec: A J Drexel Paul, Jr
Treas: Peter E Connell
(See Fla)

ST JOSEPH LEAD CO
250 Park Ave, New York 17
Chm of Bd: C H Crane
Pres: Andrew Fletcher
VP: C Merrill Chapin, Jr, Francis Cameron, Chas R Ince, R J Meckin
VP & Treas: G I Brigden
Asst Treas: E P Merrell
Cont & Asst Treas: James G Calvin
Sec: Robt Ramsey
Asst Sec: W J Elliot, D K Laurie
EDWARDS & BALMAT MINES, Balmat, St Lawrence Co, undergr, Zn, PbS, FeS
Mgr: Marshall G Jones
(See Mo, Pa)

SHAHMOON INDUSTRIES, INC
55 Liberty St, New York 5
Ch of Bd & Pres: Solomon E Shahmoon
VP: Fred Pruner
Sec: Louis Maier
Purch Agt: Fred Djodda
(See N J)

SHATTUCK DENN MNG CORP
120 Broadway, New York 5
Pres: Thomas Barden
VP: S S Shattuck
Asst VP: R J Higgins, T W Newell, D M Kentro
Sec: John A Mass
Treas: Thomas V Tossi
(See Ariz, Colo)

SHAWANO DEVEL CORP
430 Park Ave, New York 22
Pres: Alexander L Guterma
VP: Herman Close
Sec: John Bollinger
Treas: R J Eveleigh
Asst Sec: Mrs Barbara Peragine

SOUTHWEST POTASH CORP
(Subsid of THE AMERICAN METAL CO, LTD)
161 Broadway, New York 6
Pres: T W Childs
VP: John Payne, Jr, T G Moore, Thomas E Camp, Jr, F H Stewart, Jean Vuilleque
Sec: E A Weil
Treas: Hans A Vogelstein
Cont: Herbert B Cohen
(See N Mex)

TENNESSEE COPPER CO
61 Broadway, New York 6
Pres: E H Westlake
Sec: Henry Kaufman
(See Tenn)

TRI-STATE ZINC, INC
70 Pine Street, New York 5
Pres: R F Playter
VP: V C Allen
Sec & Treas: J B Nicholls
(See Ill, Va)

TUNGSTEN MNG CORP
500 Fifth Ave, New York 36
Pres: W Lunsford Long
VP: F A McGonigle, H S West, Jr
Sec: C R Skinker
Treas: J F Wilmott
(See N C)

UNION CARBIDE NUCLEAR CO, DIV OF UNION CARBIDE & CARBON CORP
30 E 42nd St, New York 17
Pres: Lyman A Bliss
VP: Clark E Center, L M Currie, Oscar F Holmgren, A Q Lundquist, W M Smart
(See Calif, Colo)

U S BORAX & CHEM CORP
U S POTASH CO DIV
30 Rockefeller Plaza, New York
Chm of Bd: Frederick A Lesser
Pres: James M Gerstley
VP & Gen Mgr: Patrick J O'Brien
VP & Gen Mgr, U S Potash Co Div: Dean R Gidney
VP: George A Connell, J Frederick Corkhill, Dean R Gidney, David V Parker, Paul Speer
VP, Foreign Oper: Norman C Pearson
Sec & Treas: Richard F Steel
Asst Sec: Wesley A Ackerman, Walter F Dingley
Asst Treas: Raymond C Desta, John H Hadfield
(See Calif, N Mex)

U S GYPSUM CO
Oakfield
OAKFIELD MINE, undergr, gypsum
(See Calif, Colo, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, Tex, Ohio, Okla, Utah, Va)

UNIVERSAL ATLAS CEMENT CO
100 Park Ave, New York 17
OPERATIONS, Clarence Center, gypsum
(See Okla)

VANADIUM CORP OF AMER
430 Lexington Ave, New York 17
Pres: W C Keeley
VP, Mng: D W Viles
Sec: D A Shriver
Purch Agt: F W Thomas
Treas: L C Miller
(See Ariz, Colo, N Mex, Utah)

VULCAN SILVER LEAD CORP
100 Park Ave, New York 17
Pres: J T Hall
VP: R F Mahoney
Sec: E A Sais
(See Calif)

NORTH CAROLINA

APPALACHIAN SULPHIDES INC
36 Toronto St, Toronto, Ontario, Canada
Pres: J Cunningham-Dunlop
VP: W H Woods
Treas: H E Nauss
Sec: Phillip Bastedo (New York City)
ORE KNOB MINE, Jefferson, undergr
Gen Mgr: J P Cowley
Mine Mgr: Philip Eckman
Under devel
(See Va)

CAROLINA PYROPHYLLITE CO
1104 E Wendover Ave, Greensboro
VP: John E Boyd
MINE & MILL, Staley
MINE & MILL, Glendon

CHESAPEAKE & COLORADO CORP
900 16th St, NW, Washington 6, D C
MOUNT CELO & BAILEY MINES, Spruce Pine, feldspar, mica
Gen Supt: Tom Campbell
Prod: 2,000-3,000 lbs book mica weekly
(See Colo)

FELDSPAR CORP, THE
Box 338, Spruce Pine
Pres: N Clearwood
VP: F S Miller, C P Rogers, Jr
Sec-Treas: Glenn N Blevins
MINE, Spruce Pine, surface, feldspar
Gen Mgr: Carroll Rogers Jr
Asst Gen Mgr: P C Coletta
Supt: Ralph Hughes
Met: L L McMurray
Frm: Robert Boone

FLOT MILLS, Spruce Pine, Burnsville, Tenn, Ga
Supt: Ralph W Hughes, Spruce Pine
Asst Supt: Carl Burleson, Spruce Pine
Total Capacity: 1,000 tons per day
(Subsid of Pacific Tin Consol Corp)
(See Ga, Tenn)

FOOTE MIN CO, INC
King Mt
Gen Mgr: N O Johnson
Asst Gen Mgr: E Goter
Geol: T Kesler
KINGS MOUNTAIN MINE, 3 mi SE of King Mtn, surface, spodumene, road rock
Mine Supt: E R Goter
HEAVY MEDIA FLOT MILL, at mine
Supt: Wm Hudspeth
Ch Chem: R Lincoln
(See N H, Pa, Va)

INTERNAT'L MINERALS & CHEMICAL CORP
20 N Wacker Dr, Chicago 6, Ill
MINE, Kona, open pit, feldspar
Gen Supt: L W Freeman, Jr
Asst Gen Supt: Robah Thomas
Mine Supt: C Buchanan
Prod: 1,000 tons
MINE, Spruce Pine, open pit, feldspar
Gen Supt: Charles Hickey
Asst Gen Supt: Claude Thomas
Mine Supt: C Stamey
Prod: 700 tons
FLOT PLANTS, at mines
(See Ariz, Colo, Ill, Fla, Me, Miss, N Mex, Ohio, S D, Tenn, Va, Wyo)

KINGS MT MICA CO, INC
Box 768, King Mt
Pres: James B Preston, Jr
VP: P B Hendricks
Sec: Hamilton Douglas, Sr
Treas: Roy H Gunter
Gen Mgr: Paul A Lancaster
PATTERSON MINE, 2 mi NW of Kings Mt, surface, mica
Prod: 400 tons
400-TON MILL, at mine
Mill Supt: James E White
MOSS MINE, 4 mi SW of Kings Mt, surface, mica
Under devel
400-TON MILL, at mine
Mill Supt: Marvin Lancaster

LITHIUM CORP OF AMERICA INC
Bessemer City
BESSEMER CITY MINE, open pit, lithium compounds from spodumene
Mines Mgr: J M McClure
CHEMICAL PLANT, Bessemer City
Plant Mgr: R N Nielsen
(See Minn, S D)

PACIFIC TIN CONSOL CORP
(See The Feldspar Corp)

SOUTHERN MICA CO
Johnson City, Tenn
MINE, Newdale, open pit, mica
Gen Supt: George W Edge
(See Tenn)

STANDARD MINERAL CO
Robbins
Pres: F B Vanderbilt
VP: H B Vanderbilt
Sec: Fred Chappell
Treas: F C Gens
Purch Agt: W J Woodward
MINE, undergr, open pit, pyrophyllite
Gen Mgr: Fred Chappell
Asst Gen Mgr: Roy Harris
Eng: Paul Ward
Mine Frm: Cecil Horner
FINE GRINDING MILL, at mine
Mill Frm: H L McLaurin
Capacity: 75,000 tons annually

TUNGSTEN MNG CORP
P O Box 931, Henderson
VP & Gen Mgr: James R Sweet
Gen Supt: W R Atkins
Purch Agt: G V Boyd
Ch Eng: A M Szynkiewski
Master Mech: W F Edwards
HAMME MINE, Tungsten, undergr, WO_3 concentrates, hubnerite, scythetic, scheelite
Mine Supt: E H Roberts
Asst Mine Supt: J W Aker
Mine Eng: R M Richmond
Prod: 1,100 tons
930-TON FLOT-GRAV MILL, at mine
Syn Scheelite Pl Supt: Carl F Gemmel
Asst Pl Supt: J V Hamme
Mill Frm: R Lee Angel
Assay: S B Adams
(See N Y)

NORTH DAKOTA

GARDNER, WALCH & SCHUMACHER
New England
Partners: Leo Gardner, Wyatt Walch, R C Schumacher
SMITH & GEARY LEASE, surface
U_3O_8 in lignite coal
(Under devel by Ohio Oil Co)

MINERAL MNG CO, INC
Box 127, Medora
Pres: W J Rhy
VP: Ruth E Ray
Sec: Carl B Olsen
Treas: Virginia L Hewson
Supt, Explor & Devel: J H Ray
(See Utah)

NORTH AMER URANIUM INC
Box 454, Jamestown
Pres: J H Archer
VP: Orville Christianson
Sec-Treas: John Hjelum
(See Wyo)

OHIO OIL CO
P O Box 199, Casper, Wyo
URANIUM Exploration

OHIO

AMERICAN ZINC OXIDE CO
(Subsid of AMERICAN ZINC, LEAD & SMELT CO)
1515 Paul Brown Bldg, St Louis 1, Mo
REFINERY, Columbus
VP & Gen Mgr: A C Eide
Gen Supt: W T Maidens
Purch Agt: C M Chambers
(See Ariz, Ill, Mo, Okla, Tenn, Tex, Wash, Wis)

BASIC INCORPORATED
845 Hanna Bldg, Cleveland 15
Pres: H P Eells, Jr
Purch Agt: G H Rutherford
MAPLE GROVE QUARRY & PLANT, (Mail: Pectorial), Maple Grove, Seneca County, surface, dolomite
Works Mgr: A M Cairo
(See Nev)

BUTLER BROS
1300 Leader Bldg, Cleveland 14
Chm of Bd: Patrick Butler
Pres: G W Humphrey
VP: R C Fish, J C Rieger
Sec: L W Spang
Treas & Asst Sec: C W Gardner
(See Minn)

CLEVELAND-CLIFFS IRON CO, THE
1460 Union Commerce Bldg, Cleveland 14
Chm of Bd: A C Brown
Pres: W A Sterling
VP: D R Forrest
VP, Mng: C W Allen
VP, Finance: H S Harrison
VP, Law: J B Kerr
VP, Sales: J S Wilbur
VP, Marine Dept: H L Gobeille
Asst VP, Mng: Fayette Brown, Jr
Gen Mgr: G C Holt
(See Mich, Minn)

CONSUMERS ORE CO
1300 Leader Bldg, Cleveland 14
Chm of Bd: J H Thompson
Pres: G W Humphrey
VPs: R C Fish & J C Rieger
Sec: L W Spang
Treas & Asst Sec: C W Gardner

CONTINENTAL MINERAL PROCESSING CORP
1st Nat'l Bank Bldg, Cincinnati 2
Pres & Gen Mgr: Frederick A Bunck
VP: Albert E Gregan, G D Slaughter
Sec: Vincent H Beckman
(See Fla)

DOUGLAS MINING CO
1300 Leader Bldg, Cleveland 14
Chm of Bd: J H Thompson
Pres: G W Humphrey
VP: Perry G Harrison, R C Fish, J C Rieger
Sec: L W Spang
Treas & Asst Sec: C W Gardner
Asst Treas: S L Engel

EAGLE-PICHER CO, THE
INSUL DIVISION
American Bldg, Cincinnati
Pres: T Spencer Shore
VP & Treas: Carl A Geist

VP & Controller: Wm R Dice
VP & Gen Mgr, Mag & Smelt Div: O A Rockwell
VP & Gen Mgr, Chem Div: Miles M Zeller
VP & Gen Mgr, Fabricon Div: Louis A Fisher
(See Aris, Ill, Kans, Nev, Okla, Wis)

M A HANNA CO, THE
1300 Leader Bldg, Cleveland 14
Agent for the following companies: Butler Bros, Consumers Ore Co, Douglas Mining Co, Hanna Coal & Ore Corp, Hanna Iron Ore Div (Nat'l Steel Col, Hanna Ore Mining Co, Morton Ore Co, Ozark Ore Co, Phillbin Mining Co, Richmond Iron Co, South Agnew Mining Co
(See Cmng)

HANNA COAL & ORE CORP
1300 Leader Bldg, Cleveland 14
Chm of Bd: J H Thompson
Pres: G W Humphrey
VP: J W Buford, R C Fish, J K Gustafson, Perry G Harrison, H L Pierce
Sec: L W Spang
Treas: W C Pieper
Asst Treas: R E Beal, S L Engel
Asst Sec: C W Gardner, L E McChesney, W C Pieper
(See Mich, Minn)

HANNA IRON ORE CO
1300 Leader Bldg, Cleveland 12
Chm of Bd: J H Thompson
Pres: G W Humphrey
VP: R C Fish, J C Rieger
VP & Sec: Paul E Shrouds
Asst Sec: L W Spang
Asst Sec & Treas: C W Gardner
Asst Treas: S L Engel, C G Tourney
(See Mich, Minn)

HANNA ORE MINING CO
1300 Leader Bldg, Cleveland 14
Chm of Bd: J H Thompson
Pres: G W Humphrey
VP: R C Fish, J C Rieger, R W Whitney
Sec: L W Spang
Asst Sec & Treas: C W Gardner
Asst Treas: S L Engel
(See Minn)

INTERNAT'L MINERALS & CHEM CORP
20 N Wacker Dr, Chicago, Ill
MINES, Bondclay & Lawson Ohio surface, clay
Mgr: G D Anderson
Supt: Bondclay: R Jones
Asst Mgr: R H Davidson
Supt: Lawso: L Brisker
MILL, Bondclay, grinding & pulverizing
MILL, Lawso, grinding & pulverizing
(See Ariz, Colo, Fla, Ill, Mo, Minn, N Mex, N C, S D, Tenn, Va, Wyo)

MONTREAL MNG CO
(See Ogilvay Norton & Co, Ohio, and Montreal Mng Co, Wis)

NATIONAL GYPSUM CO
325 Delaware Ave, Buffalo, N Y
QUARRY & PLANT, Gilmanburg, open pit, limestone
Mine Supt: Robert Wheeler
Plant Mgr: J C Downey
Prod: 1, 100 tons
QUARRY & PLANT, Lusbey, open pit, limestone
Mine Supt: C Sexton
Plant Mgr: F Mallory
Prod: 660 tons
(See Ind, Iowa, Kans, Mich, N Y, Pa Tex, Va)

OGILBAY NORTON & CO, AGENTS, MONTREAL MNG CO
Hanna Bldg, P O Box 6505, Cleveland 1
Pres: Harris S Taylor
VP: Courtney Burton, Fred R White
VP & Treas: E W Sloss, Jr
Sec & Gen Counsel: John J Dwyer
(See Ogilvay Norton & Co, Minn, & Montreal Mng Co, Wisc)

OZARK ORE CO, (SUBSID OF HANNA COAL & ORE CORP)
1300 Leader Bldg, Cleveland 14
Pres: G W Humphrey
VPs: R C Fish, R C Rieger
Sec: L W Spang
Treas & Asst Sec: C W Gardner
(See Hanna Coal & Ore Corp, Mich, Minn, Mo, Ohio, & Ozark Ore Co, Wis)

REPUBLIC STEEL CORP
25 Prospect Ave NW, Cleveland
Pres: T P Pullen
VP: S R Johnson
Asst VP: E B Winning
Purch Agt: W T Adams
(See Ala, Mich, Minn, N Y)

RESERVE MINING CO
(Owned by Republic & Armco Steel Corp)
Guildhall Bldg, Cleveland 15
(See Minn)

SOUTH AGNEW MNG CO
1300 Leader Bldg, Cleveland 14
Pres: A F Peterson
VPs: R C Fish, G W Humphrey
Sec: L W Spang
Treas & Asst Sec: C W Gardner
(See Minn)

STANDARD SLAG CO, THE
1200 Wick Bldg, Youngstown
Pres: L A Beeghly
VP: W E Bliss
Sec: W H Kilcawley
Asst Sec: R M Lunch
Purch Agt: R L Stevenson
Ch Eng: A W Porter
(See Nev)

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
MINE, Gypsum, undergr, gypsum
Works Mgr: B E Welty
MINE, Genoa, open pit, limestone
Works Mgr: V E Coffman
(See Calif, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Okla, Tex, Utah, Va)

OKLAHOMA

AMER ZINC, LEAD & SMELT CO
Picher
Dist Mgr, J J Inman
Gen Supt: O L Ehren
Geol: Dan R Stewart
Mech Eng: W F Nutsehand
Met: R A Ammon
RIALTO, BARBARA J & LAWYERS MINES, undergr, Zn, Pb
Prod: 1, 200 tons
Mine Supt: Bert Huddleston
1, 200-TON GRAV-FLOT MILLS
Mill Supt: W H Shephard
(See Aris, Ill, Mo, Ohio, Tenn, Tex, Wash, Wis)

BETZ MNG CO
Picher
MINE, Ottawa County, Zn, Pb

BLACKWELL ZINC CO
(Subsid of THE AMERICAN METAL CO, LTD)
61 Broadway, New York 6, N Y
Pres: H de Neufville
VP: W J Cloud, E T Rose, W E Long, J Vuilleques, J Payne, Jr, A E Lee
Sec: T W Childs
Treas: H A Vogelstein
Purch Agt: W F Price
Controller: H S Cohen
SMELTER, Blackwell
Mgr: M L Hughes
Prod: 86, 000 tons Zn yrly
(See American Metal Co, Ltd, N Y)

BONNIE MNG CO
Picher
MINE, Ottawa County, Zn, Pb

BUFFALO MNG CO, THE
Box 241, Picher
Pres: W L Childress
VP: Paul Childress
Sec-Treas: H L Childress
Purch Agt: Wm G Roberts
JOE BUFFALO MINE, 1 1/2 mi E of Picher, undergr, Zn, Pb
Frm: Ben F Bailey
Prod: 300 tons

C & M MNG CO
Baxter Springs
MINE, Baxter Springs, Zn, Pb

CONTACK MNG CO, INC
10 E Central Ave, Miami (Box 849)
Pres: Orville Moore
VP & Gen Mgr: Finis Bryan
Sec: V W Sapp
Treas: G W Sapp
Asst Mgr: Orville Moore
CONTACK MINE (SOUTHSIDE LEASE) near Cardin, undergr, Zn, Pb
Prod: 200 tons

CORONADO MINES, INC
208 Wright Bldg, Tulsa 3
Pres: Milton Leon
VP: S P Bowyer
Sec-Treas: A F Bourne
(See Aris)

DONNA JOE MNG CO
Picher
MINE, Ottawa County, Zn, Pb

EAGLE-PICHER CO, THE MNG & SMELT DIV
1st Nat'l Bank Bldg, Miami
Pres: T Spencer Shore
VP & Gen Mgr: O A Rockwell
Asst to Gen Mgr: Claude Dale
Comptroller: G H Walbert
TRI-STATE MINES, Zn, Pb
Office Address: Cardin
Gen Mgr: J P Cuddeback
Asst Gen Mgr: J B Elisondo
Geol: J P Lyden
Met: Geo Komadina
Dir Personnel & Labor Rel: C D Wood
CENTRAL GRAV-FLOT MILL, Cardin
Mill Supt: Fred Phelps
ZINC SMELTER, Henryetta
Supt: Chas Condren
(See Aris, Ill, Kans, Nev, Ohio, Wis)

FLOSSIE M MNG CO
Picher
MINE, Ottawa County, Zn, Pb

GRAY MNG CO
Picher
MINE, Ottawa County, Zn, Pb

GULF COAST WESTERN OIL CO
916 Republic Bldg, Oklahoma City
Pres: F B Henson
VP: R H McVay, Frank P Douglass
Sec-Treas: W O Stouts
Purch Agt: J B Henson
(See Colo)

HARRISON GYPSUM, INC
P O Box 178, Lindsay
MINE, near Cement, surface, gypsum

KERR-McGEE OIL INDUSTRIES, INC
Kerr-McGee Bldg, Oklahoma City
Pres: D A McGee
VP: A TF Seale (Shiprock, N Mex)
Sec: J H Lollar
Treas: S B Robinson
Purch Agt: D W Lindsay
(See Aris, Colo, N Mex, Wyo, and Kermac Nuclear Fuels, Colo, N Mex)

L & B MNG CO
Picher
MINE, Zn, Pb

L & W MNG CO
Picher
MINE, Ottawa County, Zn, Pb

LUCKY FIVE MNG CO
Picher
MINE, Hunt, Vanpool, Pb, Zn

LUCKY JIM MNG CO
Picher
MINE, Ottawa County, Zn, Pb

MARK TWAIN MNG CO, THE
Box 141, Picher
Pres: W L Childress
VP: W H Childress
Sec-Treas & Gen Mgr: H L Childress
Purch Agt: Wm G Roberts
Mine Frm: C A Enders
FARRETT MINE, 2 mi W & 3 mi N of Picher, undergr, Zn, Pb
Prod: 50 tons
SKELTON MINE, 1 mi S of Picher, undergr, Zn, Pb
Prod: 315 tons
(See Kans)

MARSHA ANN MNG CO
Picher
MINE, Ottawa County, Zn, Pb

OTTAWA MNG CO
Bromide
MINE, Ottawa County, Zn, Pb

OZARK-MAHONING CO, MINING DIV
P O Box 449, Tulsa 1
Pres: C O Anderson
VP & Treas: S H Davis
Sec: R T Lindmark
Comptroller: K R McWilliams
Purch Agt: J C Petree
VP & Gen Mgr: A G Johnson
Asst Gen Mgr: H E Bailie
Gen Supt, Western Div: R K Wisco
Geol: E A Brecke, Forest Hansen
Met: Wayne Fowler
(See Colo, Ill, Ky, N Mex)

RESIDUE MNG CO
Picher
MINE, Zn, Pb

SCOTTY MNG CO
Picher
MINE, Ottawa County, Zn, Pb

SIMS, DEWEY S
Miami
MINE, Rits, Pb, Zn

SKY HIGH MNG CO
Picher
MINE, Smoky Hill, Pb, Zn

TONGAHA MINING CO
Box 366, Picher
Pres: Clarence A Miller
VP & Gen Mgr: O K Tucker
Sec: W A Brewer
KITTY MINE, 2 mi W of Picher, undergr, Zn, Pb
Mine Frm: Leslie L Marcus
Prod: 150 tons

TULSA MINERALS CORP
Box 5216, Tulsa
Pres & Gen Mgr: J S Burdon
VP: P T Thibodaux
Sec & Treas: W G Eastman
Purch Agt: John W Cleary
(See Aris)

U S GYPSUM CO
300 W Adams St, Chicago 6, Ill
QUARRY, Southard, open pit, gypsum
Works Mgr: R C Gimlin
Quarry Supt: D F Underwood
(See Calif, Colo, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Tex, Utah, Va)

UNIVERSAL ATLAS CEMENT CO
100 Park Ave, New York 17
WATONGA MINE, Blaine County, surface, gypsum
(See N Y)

W M & W MNG CO
Picher
MINE, Ottawa County, Zn, Pb

S A WALTON & SONS
Fairview
MINE, near O'Keene, Blaine County, surface, gypsum

WESAH MNG CO
Treece
MINE, Ottawa County, Zn, Pb

OREGON

ADAMS, EVERETT
Jacksonville
BIG APPLEGATE MINE, Jackson County, Au

ANDERSON, J A & TOWELL PAUL D
Vale
MULE SHOE MINE, Malheur County, Cr

ARENTZ-COMSTOCK
870 1st Security Bldg, Salt Lake City, Utah
BRENTZ MINE, Malheur, County, Hg

ARNOT, PAT
1801 Hwy 99, Grants Pass
BLACK HAWK MINE, Cr

ASHLAND MINING CO
835 N Main St, Ashland
Mgr: Dewey & Fred Van Curler
ASHLAND MINE, 3 mi NW of Ashland, undergr, WO_3, Cr
50-TON GRAV MILL & CONCEN
MATTERN MINE, 2 mi N of Ashland, undergr, WO_3
Prod: 5-10 tons

AXTELL & PRESSLER
Grants Pass
MINE, Au, Ag, Cu

BAKER DREDGING CO
Sumpter Valley
MINE, Baker County, Au, Ag

BALL, CHESTER Z & KRUSE, J W
Rt 1, Box 181, Gold Hill
BLACK BOY NO 1, 2, 3 MINES, Jackson County, Cu

BLACK SHEEP MNG & MLG CO
Takilma
ESTERLY MINE, Josephine County, Cr

BOAZ MNG CO
708 Joshua Green Bldg, Seattle, Wash
Op: James P Jackson, Sumpter
BUFFALO MINE, Grant County, Au, Ag, Cu, Pb

BONANZA OIL & MINE CORP
Sutherlin
Pres & Gen Mgr A L Albee
Sec: Dudley Millican
Treas: J H Beck
Purch Agt & Gen Supt Burt Avery
Geol: Dr Lloyd Staples
BONANZA MINE, 8 mi E of Sutherlin, undergr, Hg
Mine Supt: Burt Avery
Mine Frm: T W Bidwell, Sr
Prod: 65 tons
MILL, at mine, 4 x 60 ft rotary kiln
Mill Supt. T W Bidwell, Jr
Assay: Naomi Avery

BOWERS CHROME
48 Rose Ave, Medford
Pres & Gen Mgr D W Bowers
HARRY SORDY MINE, undergr & surface, chromite
(Leased to Geo Tulare, Goldhill, Oreg)

BRADLEY & EKSTROM, INC
320 Market St, San Francisco, Cal
MINES, various parts of Oregon
(See Calif)

BREWER, GEORGE W
727 S Central, Medford
MINE, Jackson County, Au, Ag

BRISTOL SILICA CO
Box 505, Rogue River
Pres: Fayette I Bristol
BRISTOL MINE, 5 mi E of Rogue River, surface, silica
Mine & Mill Supt Rolland Jones
Cons Eng A O Bartell
Prod: 200 tons
MILL, Rogue R, Cap: 100 tons

BRUNEAU, H L
Bates
DAVIS CREEK MINE, Grant County, Au, Ag

BRYANT, MRS BERNICE
P O Box 94, Baker
BAY HORSE MINE, Baker County, Au, Ag

CANYON CREEK MNG CO
Box 731, Redmond
Reid & Zimmerman
MOTHER LODE MINE, Crook County, Hg

CRESSER, L E & BAUMGARTNER, FRED
Box 168, Brookings
ROSIE CHROME MINE, Cr

CHROME INDUSTRIES, INC
1100 NW F St, Grants Pass
"F" ST CHROME MILL, Josephine County, Cr

COLLINS, T E & BLOSS, STEPHEN
Rt 1, Box 64, Central Point
BLUE JAY MINE, Cr

COMSTOCK URANIUM TUNGSTEN CO
Box 416, John Day
Op: J J Kinsella
HAGGARD & NEW MINE, Grant County, Cr

CORDERO MINING CO
131 University Ave, Palo Alto, Cal
Gen Mgr J Eldon Gilbert
HORSE HEAVEN MINE Ashwood
46 mi E of Madras, undergr, surface, Hg
Gen Supt. Verne Hans
Mine Supt. F E Lewis
Gen Frm. C J McClain
Prod: 30 tons
30-TON ROAST MILL, 17 mi E of Ashland
(See Calif, Idaho, Nevada)

COSTER, O K & WIKSTROM, C C
Box 238, Powers
INDEPENDENCE MINE, Cr

CROSS, KENNETH
P O Box 104, Baker
RANES MINE, Baker County, Mp

DAVIS, JOSEPH I
2209 Cherry St, Baker
MIDAS KING MINE, Baker County, Au, Ag

DOLAND, ROBERT S
Rt 3, Box 721, Grants Pass
TWIN RIDGE MINE, Cr

DUNN, ALBERT
Canyon City
DUNN MINE, Grant County, Cr

EICKEMEYER BROS
Post
MAURY MT MINE, Crook County, Hg

FINDLAY, GLENN
Canyon City
KINGSLEY MINE, Grant County, Cr
Under devel

GALLAHER, J G
716 NE "A" St, Grants Pass
OREGON CHROME MINE, Josephine County, Cr

GARDNER, FRED
Harbor
FOURTH OF JULY MINE, Curry County, Cr

GARDNER, WILLIAM W
Box 176, Canyon City
WARD & ZERO MINES, Grant County, Cr

GRABNER, KENNETH
2310 Second St, Baker
BALD MT, THOMAS & UNITY MINES, Baker County, Au, Ag, Cu

GRASSMAN, W T
Rt 1, Box 252, Central Point
BEAR CREEK MINE, Jackson County, Au, Ag

GREAT LAKES CARBON CORP, DICALITE DIV
Terrebonne
PLANT NO 3, surface, diatomaceous earth
Supt: E W West
(See Calif, Colo, Nev, N Mex)

GREENHORN MT DEVEL CO
Baker
PYX MINE, Grant County, Au

GRISSOM, J H
Selma
DEEP GORGE MINE, Josephine County, Cr

HANNA COAL & ORE CORP, ORE DIV, (SUBSID OF M A HANNA CO)
P O Box 305, Riddle
NICKEL MTN MINE, surface
Gen Mgr E S Mollard
Mine Supt: R W Whitney, Jr
Mine Frm: H J Servant
Mine Eng: E J Maney
Geol. W A Foster
(See Mich, Ohio)

HANNA NICKEL SMELTING CO, (SUBSID HANNA COAL & ORE CORP)
Box 305, Riddle
Gen Mgr: E S Mollard
ELEC MELT PLANT
Pl Mgr: E E Coleman
Supt. L E Rosser
Prod: 17,000,000 lbs nickel yrly

HAYES, BURT S
Box 422, John Day
MINE, Cr

HEATHMAN, HARRY G
John Day
MINE, Cr

HEKHOLA, BILL
7142 N Maryland Ave, Portland
MINE, Umatilla County, Au, Ag

HILL, W L
Bourne
MINE, Au, Ag, Cu

HI-POTENTIAL MINES
Main & River Sts, Cottage Grove
Owner: Ray E Nelson
UTOPIAN, SWEEPSTAKES & HIAWATHA GROUPS, 25 mi SE of Cottage Grove, undergr, Au, Ag, Cu, Pb, Zn
Under devel
5-TON GRAV MILL, Bohemia
VESUVIUS MINE, Bohemia, undergr, Au, Ag, Cu, Pb, Zn, Mn
(Under lease)

JACKSON, TOM
Dale
MINE, Grant County, Au, Ag

KARTES, DOROTHY A
Star Route, Glendale
PROPERTIES, undergr, Cr, Mn, U_3O_8, Cu
Idle

KELLY, GUY
725 Pennsylvania Ave, Medford
MINE, Curry County, Cr

KINCAID, C O
Gold Hill
POOTS CREEK MINE, Jackson County, Au

KING & HANSEN MNG CO
Selma
Op: Roy Hansen
CHROME KING MINE, Josephine County, Cr

KREWSON, L O
Wolf Creek
WOLF CREEK MINE, Josephine County, Au

KUBESH, JAMES E
1022 9th Ave, Sweet Home
BLUE HAVEN A NEW DISCOVERY MINE, Quartzville, undergr, placer, Au, Ag, Pb
Under devel
(See Idaho)

LACOMBE, MICHAEL S & DUNCAN, T D
9218 SE Washington St, Portland
SHAMROCK MINE, Baker County, undergr, Au, Ag
Under devel

LAKEVIEW MNG CO
Marius Theatre Bldg, Lakeview
Pres Dr. Garth W Thornburg
VP: John Murchison, Perry Bass
Sec-Treas Vance Thornburg
Asst Sec-Treas T R Conn
WHITE KING MINE, 16 mi from Lakeview on Auger Creek, undergr, U_3O_8
Gen Mgr James P Poulos
Geol. Howard B Dutro

McCALEB, B A
Selma
McCALEB CHROMITE MINE, Curry County, Cr
TWIN CEDARS MINE, Josephine County, Cr
CONC PLANT, Curry County

McCULLOUGH, LLOYD
Box 241, Durbee
PATSY D MINE, Baker County, Au, Ag

McSHANE M J & ADAMS, M E
500 E Park St, Grants Pass
BLACK PRINCE & SAD SACK MINE, Josephine County, Cr

MERCURY & CHEMICALS CORP
342 Madison Ave, New York 17, N Y
BLACK BUTTE MINE, Black Butte, Hg
Gen Mgr Herbert P Larsen
Mine Frm: John E Johnson
Prod. 40 tons
RETORT SMELTER, Black Butte
Frm. Sidney T Sheets
(See N Y)

MILTON, A J
Grants Pass
MINE, Josephine County, Au

MINERAL SANDS CO
c/o W C Wright, Box 5271, Lansing
CHROMITE PLANT, Coos County

MOORE, A N
Drew
MINE, Ag, Cu

MOOTHART, ARTHUR
3919 SW Bourne St, Roseburg
RED HILL CHROME MINE, Grant County, Cr

OLSSON, HAROLD & PRINGLE, E W
Ronan, Montana
GLASS BUTTE MINE, Lake County, Hg
Under devel

OREGON CHROME MINES, INC
Box 475, Grants Pass
MINE, Oak Glen, 15 mi NW of Selma, undergr, Cr
Gen Mgr: William S Robertson
Supt: C O Anderson
Prod: 20 tons

OREGON URANIUM CORP
8310 NE Hwy 99, Vancouver, Wash
GLASS BUTTE MINE, Lake County, Hg
Under devel

ORE ENOR & CHEM CO
P O Box 1048, Scappoose
MILL & MINE, Columbia County, Fe

PETRIE, THOMAS M
630 Grandview Ave, Grants Pass
YELLOW JACKET MINE, Douglas County, Cr

PICKLES, E L
Richland
MINE, Ag, Cu

PROFILE TAMARACK MINES CO
c/o E P Slovarp, 309 SW 4th Ave, Portland 4
Pres Charles E Thompson
VP & Purch Agt. Henry T Abstein
Sec-Treas: Emile P Slovarp
(See Idaho)

RADCLIFFE, R W
305 Union St, Salem
LUCKY L & R MINE, Josephine County, Cr

RADIORE MNG & EXPLOR CO
Box 68, Milton-Freewater
(See Idaho)

RASMUSSEN, C A
Granite
TEN CENT PLACER, 3 mi NW of Granite, Au
Under devel

SAGE HOLLOW MNG INC
Umpqua Savings & Loan Bldg
Roseburg
Pres E L Paris
VP Flossie Kennaday
Sec-Treas Forest J Kennaday
MINE, surface U_3O_8
Gen Mgr E L Paris
Under devel
MILL, Crook County

SHAWANO DEVEL CORP
430 Park Ave, New York 22, N Y
MINE, Brets, Malheur County, Hg
(See N Y, Wyo)

SHORT, COY B & BAILEY, B A
John Day
LOST BUCK MINE, Cr

SNAVELY, O M
Rt 2, Box 19, Jacksonville
OLD FEDERAL MINE, Jackson County, Au, Ag

SOURDOUGH MINE
Grants Pass
Op: Ben Baker
MINE, Curry County, Cr
CONC PLANT, a spec
Supt. Howard Beasley

STINNETT, W A & JOHN
Canyon City
DRY CAMP MINE, Grant County, Cr

STONE, QUENTIN
301 NE "D" St, Grants Pass
LAST CHANCE MINE, Josephine County, placer, Au, Ag

O W STUEMPEGES & SONS
Box 8, Myrtle Creek
"A" MINE, Douglas County, Cr
Under devel

SUNBURST URANIUM CORP
1975 NW Everett St, Portland 9
Pres James C Young
Exec VP: Dr Sam B Lee
VP: Ernest L Miller, Harold F Ridings, Dr Bryan D Lee
Sec-Treas Kay Critchlow
(See Nev, Utah)

TAYLOR, ELTON B
411 NW Eighth, Pendleton
OK MINE, Malheur County, placer, Au, Ag

TUCKER, GEORGE H
525 N Riverside, Medford
BERTON PEAK MINE, Jackson County, Au, Ag

TULARE BROS
731 Bruggess St, Grants Pass
(See Calif)

TULARE, GEORGE
Rt 2, Box 371, Gold Hill
SYLVANITE MINE, 3 mi E of Gold Hill, undergr, Au
Idle

VAD-ORES EXPLOR CO
633 Med Arts Bldg, Portland
Pres. V E Ruedy
Sec-Treas: T B Pyock

WATERMORE, RALPH
Mitchell
MINE, Wheeler County, placer, Au, Ag

WATKINS, KENNETH
Granite
MINE, Au, Ag, Cu, Pb

WINTER CREEK MNG CO
5121 SW Cameron Rd, Portland
WINTER CREEK MINE, Crook County, Hg
Idle

PENNSYLVANIA

ALAN WOOD STEEL CO
Conshohocken
Pres: H B Wood
VP: C E Davis
Sec-Treas: C L Jones
Mgr: L A Mohr
Ch Eng: P C Schoen
Dir, Personnel: C D Dorworth
VP & Compt: H W Read
(See N J)

ALUMINUM CO OF AMERICA, MINING DIV
1501 Alcoa Bldg, Pittsburgh 19
Pres: I W Wilson
Sec: Alfred M Rust
Treas: E H Wilber
Purch Agt: Ralph Keefer
Gen Mgr in Ch: Lawrence Litchfield, Jr
(See Ark, Ill)

AMERICAN METAL CO, LTD DUQUESNE DIVISION
61 Broadway, New York 6, N Y
SMELTER, Pittsburgh, Zinc-base alloy production
Mgr: W F Teehuppot
(See N Y)

BESTWALL GYPSUM CO
120 E Lancaster Ave, Ardmore
Pres: Rawson G Linaro
Exec VP: Malcolm Meyer
Sec: Arthur D Graves
VP: P E Fischer
VP & Compt: J B Johnston
Purch Agt: J I Trolley
Asst Sec & Treas: J L Strickland
(See Iowa, Ky, Mich, N Y, Tex, Utah)

BETHLEHEM CORNWALL CORP
701 E Third St, Bethlehem
Pres: A F Peterson
Mgr: S J Shale
CORNWALL MINE, Cornwall, Fe Cu, Au, Ag, S
6,000-TON MAG CONCENTRATOR
2,500-TON FLOT PLANT
1,600-TON SINTERING PLANT
GRACE MINE, Morgantown, Py, S
MAG CONC, FLOT PLANT, pelletizing plant

CLIMAX MOLYBDENUM CO
Langeloth
(See Calif, Colo, N Y)

FOOTE MINERAL CO
18 W Chelten Ave, Philadelphia 44
Pres: L G Bliss
VP: F B Shay
Sec: E G Buck
Treas: J S Gates
Purch Agt: W M Raynor
Gen Prod Mgr: W B Towner
(See N H, N C, Tenn, Va)

INTERNAT'L SALT CO, INC
Scranton
Pres: E L Fuller
VP: H J Osborn, H M Griffiths, J L Ryan, Jr, E N Green, M L Hyman
Sec: H J Osborn
Treas: M D Fuller, Jr
(See N Y)

JONES & LAUGHLIN STEEL CORP
3 Gateway Center, Pittsburgh 30
Pres: H C Adams
VP, Prod: A T Lawson
Sec: H P Jones, 3rd
Treas: H H Wunderlich
(See Mich, Minn, N Y)

MOLYBDENUM CORP OF AMERICA
Washington
Wks Mgr: Eugene F Lucas
PLANT, Washington, Mo, WO_3
PLANT, York, Mo, WO_3, rare earths
Mgr: W P Allen
(See Calif, Colo, N Mex, N Y)

NATIONAL GYPSUM CO
325 Delaware Ave, Buffalo 2, N Y
MINE & PLANT, Bellefonte, limestone
Mine Supt: J Pinto
Plant Mgr: H E Gustafson
Prod: 2,500 tons
QUARRY & PLANT, York, limestone
Quarry Supt: C Tessnow
Plant Supt: W W Wallace
Prod: 800 tons
(See Ind, Iowa, Kans, Mich, N Y, Ohio, Tex, Va)

NEW JERSEY ZINC CO
160 Front St, New York 38, N Y
MINE, Friedensville
(See Calif, Colo, N J, N Mex, N Y, Tenn, Va, Wis)

ST JOSEPH LEAD CO
250 Park Ave, New York 17, N Y
SMELTER, Josephtown
Mgr: John G Wehn
(See Mo, N Y)

SNYDER MINING CO
812 Oliver Bldg, Pittsburgh
Pres: W P Snyder, Jr
VP & Gen Mgr: A L Fairley, Jr
Sec: L B Perrin
Treas: J K Foster
(See Minn)

U S STEEL CORP
525 William Penn Place, Pittsburgh 30
(See Alaska, Ala, Calif, Minn, Tenn, Utah, Wyo)

SOUTH CAROLINA

AMERICAN VERMICULITE CO
Woodruff
MINE, vermiculite

COMMERCIALORES, INC
Box 156, Clover
Pres & Gen Mgr: A R Erkel
VP: H S Doty
VP & Gen Supt: S J Beers
Sec: F Gordon Blackstone
Purch Agt: H L Wright
HENRY KNOB MINE, 4 mi W of Clover, surface kyanite
Mine Frm: Len Hardin
Prod: 500 tons
500-TON FLOT MILL
Mill Frm: Richard Lockmund, R S Rosebrake

INDUSTRIAL MINERALS INC
York
Pres & Gen Mgr: L G Wilson
VP & Sec: W F Wilson
KINGS CR MINE, 14 mi W of York, surface, barite
Prod 15 tons
KINGS CR MILL, 45-ton, crush & grind

MARINE MINERAL CORP
Aiken
PLACER, rutile, ilmenite, monazite, zircon
Supt: O H Perry

MINERAL MNG CORP
Kershaw
MINE, underg, sericite mica
Supt: Frederick Bingham

PATTERSON, J T & SONS
Linford
MINE, Vermiculite

UNITED CLAY MINES CORP
North Aiken
MINE NO 7, open pit
Mine Supt: J J Godia
MILL, at mine
(See Fla, Ga, Md, N J, Tenn)

SOUTH DAKOTA

AMERICAN COLLOID CO
Belle Fourche
BELLE MINE, surface, bentonite
Mgr: Claude Acord
Prod: 600 tons
(See Ill, Miss, Wyo)

BALD MOUNTAIN MNG CO
Trojan
Gen Mgr: P A Miller
Elec Eng: W L Hendrickson
Shop Frm: M Wood
PORTLAND, CLINTON, DAKOTA, DECORAH, GOLD BUG MINES, Trojan, undergr, open pit, Au, Ag
Mine Supt: J Lauritsen
Mine Frm: H Brown, J Giachetto, J Marsh
Mine Eng: F Zupet
350-TON CYANIDE MILL, Trojan
Mill Supt: B Olson
Mill Frm: R Shoop
Assay: Lloyd Lewis
(See Iowa)

BLACK HILLS KEYSTONE CORP
Keystone
Pres: W K Wallace
Lepidolite, mica, tantalite, feldspar
50-TON FLOT MILL
Mgr: A I Johnson

BLACK HILLS LIME CO
Pringle
QUARRY & KILN, limestone

BLACK HILLS URANIUM CO
Box 881, Edgemont
Pres: Roy E Chord
VP: Eugenia O Chord
Sec: Gordon F Kamerer
Dir: Charles M Webber
HOLDUP NO 15, 17, KADOS NO 3, 11 MINES, undergr, open pit, U_3O_8, V
Gen Mgr: Roy E Chord
Geol: Gordon Prescott
Mine Supt: Walter McKenna
Asst Mine Supt: Richard W Chord
Prod: 100-200 tons
Under devel

BROWN, E G
1114 Main St, P O Box 480, Sturgis
U_3O_8 Prod

CHORD URANIUM CO
Edgemont
U_3O_8 Prod

COLE CONSTRUCTION CO
Spearfish
QUARRY & KILN, limestone

COMMONWEALTH MNG CO OF S D
Box 893, Sioux Falls
Pres: Merle M Johnson
VP: John C Nott
Sec-Treas: Oscar Shakstad
COMMONWEALTH MINE, Deadwood, undergr, surface, U_3O_8, Au, Ag
Gen Mgr: Martin Brosnahan
Geol-Met: Alex McHugh
Under devel
(See Utah)

DAKOTA LIME & ROCK CO
Rapid City
QUARRY & KILN, limestone

DRIFTWOOD URANIUM CO
c/o I J Hauptmann, Hot Springs
U_3O_8 Prod

EDGEMONT MNG & URANIUM CORP (Subsid of GIANT RESOURCES INC)
Edgemont
Pres: L E Cox
VP: Edward A Strnad
Sec-Treas: Richard Simons
Ind Counsel: Col T R Gillenwaters
Gen Mgr: Edgar M Gillenwaters
GOULD LEASE, 12 mi N of Edgemont, Fall River County, undergr, U_3O_8
FREEZEOUT MINE, 20 mi NW of Edgemont, Fall River County, undergr, open pit, U_3O_8
TAYLOR MINE, 25 mi NW of Edgemont, Fall Riv County, open pit, U_3O_8
Mine Supt: Leion E Lewis
Asst Mine Supt: John Ellis
Mine Frm: Perry Wheeler, Glen I Young

GIANT RESOURCES, INC
P O Box 1451, Grand Junction, Colo
(See Colo and Edgemont Mng & Uranium Corp, S D)

HILLS CANYON MNG CORP
Hot Springs
Pres: Melvin Hanson
U_3O_8 Prod

HILLS MATERIAL CO
Rapid City
MINE, gypsum
QUARRY & KILN, limestone

HOLY TERROR MNG CO
Keystone
Sec: George Flavin
Gen Supt: A I Johnson
HOLY TERROR MINE, undergr & surface, spodumene, beryl, mica, columbite

HOMESTAKE MINING CO
Lead
HOMESTAKE MINE, undergr, Au, Ag
Gen Mgr: Abbott H Shoemaker
Adm Asst: L W Swent
Mine Supt: C N Kravig
Asst Mine Supt: W C Campbell
Ch Met: C E Schmidt
Geol: J O Harder
Ch Elec Eng: C L Gust
Ch Mech Eng: LeRoy Seyhers
Ch Const Eng: G N Northland
Safety Eng: Phil Graves
Purch Agt: F E Bryan
Prod: 4,500 tons
4,500-TON CYAN MILL, at mine
(See Calif, Utah, Wyo)

INTERNAT'L MINERALS & CHEMICAL CORP
20 N Wacker Drive, Chicago 6, Ill
Western Supt: J W Mitchell, Keystone
MINES, Custer, open pit, feldspar
200-TON MILL, Custer, dry grinding
Gen Supt: Ralph Brigham
Mine Supt: Arby Boone
MINE, Keystone, open pit, feldspar
75-TON MILL, Keystone
Gen Supt: Henry Berger
Mine Supt: Arby Boone
(See Ariz, Colo, Fla, Ill, Me, Miss, N Mex, N C, Ohio, Tenn, Va, Wyo)

PETE LIEN & SONS
301 Buell Bldg, Rapid City
QUARRY & KILN, limstone

LITHIUM CORP OF AMERICA, INC
2500 Rand Tower, Minneapolis 2, Minn
Pres: H W Rogers
MINES, near Hill City, undergr, surface, Li
Gen Mgr: John C Talley, Sr
FLOT-MILL, Hill City
Supt: Carleton B Harris
(See Minn, N C)

M I L URANIUM INC
1006 Parkow Ave, Rapid City
Pres: Gerald F Martin
VP: Clarence Lindley
Sec-Treas: Emmet Isaacs
STARLITE NO 2 MINE, Edgemont, undergr, U_3O_8
Under devel
GULL RAILROAD CUT, Edgemont, undergr, surface, U_3O_8
Gen Mgr: Emmet Isaacs
Prod: 50 tons
(See Wyo)

McKENSIE GULCH MNG CORP
Box 490, Sturgis
Pres: E G Brown
VP & Gen Supt: Donald L Cammock
Sec: J W Koering
Treas: Andy Wagner
Purch Agt: Tom Wagner
MARIAN MINE, open pit, U_3O_8
Gen Mgr: Andy Wagner
Asst Gen Mgr: Tom Wagner
Under devel

MAYWOOD CHEM WORKS
Hunter Ave, Maywood, N J
ETTA MINE, Keystone, spodumene
Mgr: Dewey Peterson

MID-CONTINENT EXPLOR CO
Sundance, Wyoming
MINES, Rawlins Mng dist, Tinton, columbium-tantalum, Sn, WO_3, Au
Under devel
(See Wyo)

MINERALS MILLS, INC
Custer
Pres: Albert Gushurst
Sec & Gen Mgr: A I Johnson
OLD MINE & GLENWOOD MINES
4 mi NW of Custer, undergr, surface, mica, beryl, feldspar, lepidolite
Prod: 100 tons
Under devel
100-TON CRUSHING & SCREENING PLANT, at Old Mike Mine

MINES DEVELOPMENT, INC
517 Farmers Union Bldg, Denver 3, Colo
Pres: J H M Chach
VP & F E Stout
Sec-Treas: W H Hoadley
Gen Mgr: Allen D Gray
250-TON MILL, Edgemont, Resin-in-Pulp
Mill Supt: H D Webb
Mill Frm: G H Bryant

MNG RESEARCH CORP
4215 Balsam St, Wheatridge, Colo
PILOL PLANT, Edgemont
Idle
(See Colo)

MONTANA CHEMICAL & MILLING CORP
325 Second Ave, Edgemont
Pres: Matthew J Brown
VP: James Wooten
Sec: Isaac Mellman
Purch Agt: William Kinich
RUDA & DEXTER GROUP, undergr
Gen Mgr: M J Brown
Asst Gen Mgr: E Read
Mine Supt: Vernon Martin
Prod: 100 tons
(See Pictograph Mng & Uranium Co, Inc)

PICTOGRAPH MNG & URANIUM CO, INC (Subsid of MONTANA CHEM & MLG CORP)
325 Second Ave, Edgemont
U_3O_8 Prod

PUMPKIN BUTTES MNG & EXPLOR CO
Hot Springs
Pres: Don Wheeler
Sec-Treas: I J Hauptmann
MILL, Edgemont
(See Wyo)

RIMROCK MNG CO, INC
Box 278, Sturgis
Pres & Gen Mgr: W R Peregrine
VP: Roswell Bottom
Sec-Treas: R J Ray
RIMROCK MINE, open pit, U_3O_8
Under devel

SCOTT'S ROSE QUARTZ CO
Custer
Mgr: Frank S Scott
RED ROSE & MOUNTAIN ROSE MINES, nr Custer: pegmatite minerals

SODAK URANIUM & MNG CO, INC
Evans Hotel Annex, Hot Springs
Pres & Gen Mgr: Clyde R Boyle
VP: W E Haldane
Sec: Paul Russell
(See Wyo)

SUNDANCE PETROLEUM & URANIUM CO
Box 293, Spearfish
Pres: Howard H Heldcraft
VP: Robert P Munger
Sec: R G May
Treas: Gaylord Smith
(See Wyo)

URANIUM & ALLIED MINERALS INC
Keystone
Pres: A I Johnson
VP: Don Burns
Sec: Dr E H Schmidt
DEKE LODE, KING FRACTION PONCA MINES, surfaces, Li, beryl, mica, feldspar, tantalite
HOLY TERROR MILL, flot
Cap: 100 tons per day

URANIUM & EXPLOR CO
c/o I J Hauptmann, Hot Springs
U_3O_8 Prod

TENNESSEE

AMER ZINC CO OF TENN
(Subsid of AMER ZINC, LEAD & SMELT CO)
Mascot
VP: H A Coy
Purch Agt: C C Sisk
Mgr: Wm Black
Supt, Mines: M J Langley
Ch Eng: W N Johnson
Ch Geol: Chas R L Oder
Mech & Elec Supt: I C Mitchell
Personnel Dir: P M Arthur
Safety Eng: Harold Thompson
Asst Mine Supts: J L Kellogg, Harry Miller
MASCOT NO 2 MINE, Mascot
YOUNG MINE, Hodges Station
NORTH FRIENDS STATION MINE, Hodges Station
ATHLETIC MINE, Jefferson City
GRASSELLI, New Market
COY MINE, Jefferson City
Under devel
ALL MINES, undergr, zinc, sulphide conc
4,000-TON FLOT-GRAV MILL, H M S, Jigs, Mascot
Mill Supt: D B Grove
Ch Chem: D E Chadwick
(See Ariz, Ill, Mo, Ohio, Okla, Tex, Wash, Wis)

ARMOUR FERTILIZER WORKS, INC
Columbia
Supt: W B King
PHOSPHATE MINE
(See Fla)

B & T MNG CO
P O Box 294, Bristol
B & T MINE, Johnson County, Mn

COLITZ MNG CO
Damascus, Va
COLITZ MINE, Johnson County, Mn

COLUMBIA ROCK PROD CORP
Pressnell Bldg, Columbia
Pres: Wayne Pressnell
VP: Harry Pressnell
Sec-Treas: Wm C Fraser
Purch Agt: W J Davis
MINE, undergr, limestone
Gen Mgr: Harry Pressnell
Prod: 2,000 tons
2,000-TON MILL, Columbia

CONSOL HIGH GRADE ORE CO
Partners: G S Murray, I B Murray, J O Murray
MINE, Calhoun, open pit, Ba
Mine Supt: Joe McConkey
Under devel

ESTELLE MNG CO
LAUREL BLOOMERY MINE, Johnson County, Mn

FELDSPAR CORP, THE
Spruce Pine, North Carolina
FLOT MILL, Erwin
(Subsid of Pacific Tin Consol Corp)
(See Ga, N C)

FOOTE MINERAL CO, ELECTRO MANGANESE DIV
1400 Loraine, Knoxville 1
Div Acct: Otto Neumann
TWO PLANTS, Knoxville
1323 Proctor Street
1400 Loraine Street
(See N H, N C, Pa, Va)

HARSH PHOSPHATE CO
750 Murfreesboro, Nashville 19
Gen Mgr: M G Marsh
Sec: T L Harsh
MINE, 3 mi SE of Nashville, surface, ground, phosphate rock
Prod: 125 tons

HEAVY MINERALS CO
4000 N Hawthorne Ave, Chattanooga
Pres: J C Ward, Jr
VP: E E Wyatt
Sec: K L Karr
Treas: R T Ruder
Gen Mgr: H C Laird
(See Fla)

HIGHLAND MINING CORP
Centerville
Pres & Gen Mgr: Bill Davis
VP: D Brown
Sec: M Brown
HIGHLAND MINE, Centerville surface, phosphate rock
Prod: 700 tons

INTERNAT L MINERALS & CHEMICAL CORP
20 N Wacker Drive, Chicago 6, Ill
CONSOL FELDSPAR DEPT, Erwin
Prod Mgr: Charles Hunter
Asst Prod Mgr: J R LeGrand
MICA PLANT, Erwin, dry grinding
Gen Supt: J R LeGrand
100-TON MICA FLOT PLANT, Greeneville
Gen Supt: Phil Thomas
(See Ariz, Colo, Fla, Ill, Me, Miss, N Mex, N C, Ohio, S D, Va, Wyo)

LEWIS MNG CO
Rt 3, Box 418, Erwin
LEWIS MINE, Unicoi County, Mn

MONROE MNG CO
Madisonville
WILSON MINE, Monroe County, Fe

MONSANTO CHEM CO
Columbia
MINE, 9 mi SW of Columbia, surface, dragline excav, phosphate
Gen Mgr: J L Christian
Asst Gen Mgr: H F Weaver
Purch Agt: E L Sanderlin
Mine Supt: H A Webster
Asst Supt: J W Steenbergen
Furnace Supt: R B Shaffner
Mech Eng: W G Allen
Elec Eng: R L Van Fossen
Safety Eng: H E Colser
Prod: 2,800 tons
GRAV MILL
ELEC FURN, 25,000-kw, yellow phosphorus
(See Idaho, Mo)

NATIONAL LEAD CO
Sweetwater
Mine & Mill Supt: J T Keim
MINE, surface, barite
MILL, washing, jigging, grinding
(See Ark, Calif, Kans, La, Mo, Mont, Nev, N Y, Tex, Wyo)

NEW JERSEY ZINC CO
160 Front St, New York 38, N Y
JEFFERSON CITY MINE, Jefferson City, undergr
Mgr: Johnson Crawford
Supt: H W Miller
Mine Supt: A C Savage
MILL
Mill Supt: J E Nelson
Asst Mill Supt: R E Daugherty
FLAT GAP OPERATION, Treadway
Supt: R L Sayre
(See Calif, Colo, N J, N Mex, N Y, Pa, Va, Wis)

PACIFIC TIN CONSOL CORP
(See The Feldspar Corp)

PRESSNELL PHOSPHATE CO INC
Pressnell Bldg, Columbia
Pres: Wayne Pressnell
VP: Harry Pressnell, H R Mosley
Sec-Treas: W J Davis
Asst Sec-Treas: Wm C Fraser
MINE, surface, phosphate
300-TON FLOT MILL

RIVER & RAIL PHOSPHATE CO
135 2nd Ave N, Nashville
Pres & Gen Mgr: L H Jordan
Sec: S E Wheeler
Gen Supt: Claude Warren
MINE, 6 mi NW of Nashville, surface, dragline, raw phosphates
PLANT, Jordonia, Tenn

ROCKWOOD MNG CO
P O Box 238, Rockwood
NEW CHAMBERLAIN MINE, Roane County, Fe

SOUTHERN MICA CO
Johnson City
Pres & Gen Mgr: C Bailey Rice
VP: Martha R McClain
Sec-Treas: B F McClain
40-TON GRAV MILL, Johnson City
Mill Supt: J F Reynolds
Mill Frm: Haskel Garland
(See N C)

STEWART & SEEMAN
YORK MINE, Johnson County, Mn

TENNESSEE COPPER CO
Copperhill
BURRA BURRA, EUREKA, BOYD, CALLOWAY, MARY MINES, Polk County, undergr, sulphuric acid, Fe, Cu, Zn
VP & Gen Mgr: T A Mitchell
Mgr: R R Burns
Gen Supt: Owen Kingman
Elec Eng: L B Murray
Mine Supt: H F Kendall
Asst Mine Supt: R G Clay
Prod: 100,000 tons per months
FLOT-MILL, Copperhill
Mill Supt: F M Lewis
Asst Mill Supt: James Goodman
REVERB SMELTER, Copperhill
Supt: W Y Querry
Output: 20,000,000 lbs Cu yrly
(See N Y)

TENNESSEE MANGANESE CO
Embreeville
BUMPASS COVE MINE, Union County, Mn

TENNESSEE VALLEY AUTHORITY
Knoxville
KNOB CREEK, Columbia, 3 mi N of Columbia, surface, phosphate
Gen Mgr: Aubrey J Wagner
Gen Supt: V S Wildsmith
Geol: R S Ingle
Mech Eng: Henry T Pate
Safety Eng: J H Bisson
Mine Supt: Charles A Irwin
Prod: 500 tons

TESTER, LON
Hayn
TESTER MINE, Johnson County, Mn

UNITED CLAY MINES CORP
Clesson
MINE NO 6, open pit
Mine Supt: C A Roberts
Asst Mine Supt: Doyle Bullock
Mine Eng: R D Lowe
MILL, at mine
(See Fla, Ga, Md, N J, S C)

U S STEEL CORP, TENN COAL & IRON DIV
Jefferson City
ZINC MINES WORKS
Gen Supt: R T Wilson
Geol: S K Mynatt
MINE, undergr, open pit, Zn
Mine Supt: C E Piper
Mine Frm: G H Kerr
Mine Eng: J A Miller
FLOT MILL
Mill Supt: J A Rhoton
(See Alaska, Ala, Calif, Minn, Pa, Utah, Wyo)

VALLEY MNG CO
Shady Valley
KING, BUCKLES, & DRY RUN MINES, Johnson, County, Mn

VIRGINIA-CAROLINA CHEM CORP
401 E Main St, Richmond, Va
MINE, Mt Pleasant, open pit, phosphate rock
Mgr: R J Grissom
(See Fla, Va)

VIRGINIA COAL, IRON & COKE CO
P O Box 1071, Roanoke, Va
STONEY CREEK MINE, Carter County Mn

WEINER, H I
Grayston Hotel, Mountain City
WEINER MINE, Johnson County Mn

TEXAS

A & B MNG CO
403 1st Natl Bank Bldg, Long View, Texas
U_3O_8 Prod

AMBASSADOR OIL CORP
Box 9338, 3101 Winthrop Ave
Ft Worth
Pres: F Kirk Johnson
VP: C Harrison Cooper
Sec: John Fallwell, Jr
Treas: W V Coffey
(See Colo)

AMERICAN SMELTING & REFINING CO
Box 1111, El Paso
Mgr: Ben D Roberts
EL PASO SMELTING WORKS, 2 mi N of El Paso, Pb, Cu smelting & converting, Zn fuming
Supt: T J Wodside
Pl Eng: J W English
Supply Agt: R E Redman
(See Ariz, Calif, Colo, Idaho, Ill, Kans, Md, Mont, Neb, N J, N Mex, N Y, Utah, Wash, & Fed Mng & Smelting Co, Mo)

AMER ZINC CO OF ILLINOIS
(Subsid of AMER ZINC LEAD & SMLG CO)
Box 577, Dumas
RETORT SMELTER, Dumas
Mgr: G R Bailey
Pl Eng: C R Griffin
Purch Agt: W G Holtfield
Output: 100,000,000 lbs Zn yrly
(See Ariz, Ill, Mo, Ohio, Okla, Tenn, Wash, Wis)

BALCONES CORP
403 E Travis St, San Antonio
(See Ariz)

BESTWALL GYPSUM CO
(Previously Certain-Teed Prod Corp)
Acme
MINES, undergr, gypsum
(See Iowa, Ky, Mich, N Y, Pa, Utah)

CASNER CHEMICAL CO
Box 5262, El Paso
MINE, Hudspeth County, gypsum

CENTURY MINERALS, INC
1003 Bank of the Southwest Bldg, Houston
Pres: Alex W Head

CINDERELLA URANIUM & OIL, INC
905 McBurnett Bldg, San Angelo
Pres: Marvin C Haas
VP: Royal Hart
Sec: Douglas A Williams
Treas: Joe E Robinson
Field Rep: Volvey B Enochs
Tom W Enochs
(See Colo)

CUBA INTERNAT L MNG & DEVEL CO, INC
522 Meadows Bldg, Dallas
Pres: Kenneth J Rich
VP: Celtyn Hedges
Sec: Harry Selders
Gen Mgr: Glen Fessler

DUVAL SULPHUR & POTASH CO
Mellie Esperson Bldg, Houston 2
Pres: Geo F Zoffman
VP & Treas: Eugene German
VP & Asst Gen Mgr: W P Morris
Sec: V J Thornhill
ORCHARD MINE, 3 mi SE of Orchard, sulphur
Acting Res Mgr: X T Stoddard
(See N Mex)

GENERAL MINERALS CORP
440 Meadows Bldg, Dallas 6
Pres: S Y Guthrie
VP: S Y Guthrie, III
Sec-Treas: F H Connally
Asst Sec-Treas: J A Barnett
(See Colo)

JEFFERSON LAKE SULPHUR CO
1400 Whitney Bldg, New Orleans 12, La

CLEMONS DOME MINE, Brazoria County
VP & Gen Mgr Harvey A Wilson
Asst Gen Mgr. L V LeBeuf
Purch Agt. Carl McElrath
LONG POINT DOME, Fort Bend County
(See La)

KIRK BASIN URANIUM CORP
3101 Windrop Ave (Box 9338)
Ft Worth
Pres Richard O Dulaney, Jr
VP C Harrison Cooper
Sec-Treas W V Coffey
MINE, In Colo
(See Colo)

LONE STAR MERCURY INC
Box 488, Alpine
MINE, Terlingua dist, Brewster County, Hg

LONE STAR STEEL CO
ORE DIVISION
Box 8027, Dallas
Pres. E B Germany
Exec VP W H Johnson
Div Supt. A B Drescher
VP Oper, Ree & Tech Devel L G Draper
VP Sales Walter T Moreland
VP Pb & Emp Rel L D Webster
VP Purch John M Morris
Compt Max Dodson
Sec Edwin S Greer
Gen Plant Supt. J M Brashear
Asst Gen Plant Supt. A J Malone, S G Anderson
Gen Frm, Beneficiation Vernon Camp
Met Bruce Dedman
Elec Eng L W Bramlett
Mech Eng. L Hoffman
Mng Eng V F Malone
Ore Engineering J M Clements
Ind Rel Dir G C Graves
Safety Dir Sam Beasley
LONE STAR MINES, BLACK MTN & RODGERS, SURFACE, Fe
Prod: 10, 000 net tons
10, 000-TON GRAV MILL
BLAST FURNACE
Cap 1, 300 tons daily

LONE STAR SULPHUR CORP
533 Bankers Mortgage Bldg
Houston
MINE, sulphur

MAGNET COVE BARIUM CORP
Box 6564, Houston 5
(See Ark, Nev, Wyo)

McCLUNG DRILLING CO
(Subsid of McCLUNG MNG & EXPLOR CORP)

McCLUNG MNG & EXPLOR CORP
5336 Glenwick Lane, Dallas 9
Pres Glenn E McClung
VP Ed Hoot
Sec H B Pixley
Explor

MILWHITE COMPANY INC
Box 15038 Houston
Pres. Max B Miller, Jr
Exec VP F A Frank
VP A B Willis
PRODUCERS of bleaching clays, insecticide, diluents, & carriers, barite, celestite, talc, fullers earth bentonite, fluorspar, expanded perlite, fillers, & bauxite

NASH MINES
406 Nash Bldg, Austin
Own. Jas F Nash
(See Ariz)

NATIONAL GYPSUM CO
Box 830, Rotan
QUARRY & PLANT, Rotan, surface, Gypsum
Mine Supt: T W Smith
Plant Mgr J E Irvin
Mill Supt J A Compton
Prod: 800 -1, 000 tons
(See Ind, Iowa, Kans, Mich, N Y Ohio, Pa, Va)

NATIONAL LEAD CO, BAROID DIV
Box 1675 Houston
Gen Mgr: G B Coale
Asst Gen Mgr: J W Hofstetter
Prod Mgr: Reginald Rowand
CORPUS CHRISTI PLANT, barite, dry grinding mill
Mill Supt: T A Studer
HOUSTON PLANT, bentonite, barite, dry grinding mill, oil well chem
Supt: R J Penrose
MULDOON MINE, Muldoon
bentonite, surface
Supt: R J Penrose

TEXARKANA PLANT, Texarkana, oil well chem, dry griding
Supt: J A Smith
(See Ark, Calif, Kans, La, Mo, Mont, Nev, N Y, Tenn, Wyo)

NATIONAL LEAD CO, TEXAS MINING & SMELTING DIV
Box 559, Laredo
Mgr J C Archibald, Jr
Ch Chem. Fidel Gonzalez
Compt Claude Notson
REVERB & BLAST FURNACES, FUMING PLANT, Highway 81, N Laredo
Plant Supt R L Kulpaca
(See Ark, Calif, Kans, La, Mo, Mont, Nev, N Y, Tenn, Wyo)

PAN-AM MNG CO, INC
Panhandle
Pres & Gen Mgr Clarence C Williams
VP C E Lyles
Sec. E G Stapp
Treas. Cyril Pingleton
(See Ariz)

PHELPS DODGE REFINING CORP (Subsid of PHELPS DODGE CORP)
Box 1372, El Paso
ELEC COPPER REFINERY, COPPER SULPHATE PLANT also NiSO, Se, Te
Works Mgr. E W Donahue
Asst Works Mgr. B B Kinkle
Prod: 576, 000, 000 refined cu yrly
(See Ariz, N Mex, N Y)

RARE METALS CORP OF AMERICA
1st Security Bldg, Salt Lake City 11, Utah
(Subsid of EL PASO NATURAL GAS CO, Texas St at Stanton, Box 1492, El Paso)
Pres. Paul Kayser
VP & Gen Mgr C L Perkins
(See Ariz, Idaho, Utah)

SEABOARD OIL & GAS CO
900 Oil & Gas Bldg, Wichita Falls
Pres Joseph H Corbin
VP, Mng: Ray A Bennett
VP, Oil Floyd H Corbin
Sec-Treas. Jo Ann Frost
Purch Agt. H L Corbin
Petroleum Eng: Don F Pierce
Ch of Bd: Roy Iles
(See Socorro Uranium, Corp, Colo, N Mex)

SHEFFIELD STEEL COMPANY
Houston
MINES, Fe

SOUTHWESTERN GRAPHITE CO
Burnet
Pres George W Clemens
VP: Robert P Miller, Sr
VP & Gen Mgr R P Miller Jr
Sec-Treas Robert P Miller Jr
Supt G E Hilliard
Met D C Peacock
Elec Eng. Frank Withers
MINE, 11 mi NW of Burnet, surface graphite
Mine Frm Pete Bible
Prod: 250 tons
200-TON FLOT MILL, at mine
Mill Frm. Tom McAllister
Assay James Wright

SOUTHWESTERN PORTLAND CEMENT CO
El Paso
MINE, Hudspeth County, gypsum

SOUTHWESTERN TALC CORP
Llano
Pres. Bertram Browne
VP Clinton G Brown, Jr
Sec-Treas Fred C Greco
Sec Tracy Ward
MINE, open pit, commercial talc
Gen Mgr J B Upton (Van Horn, Tex)
Prod: 165 tons
ROLLER MILLS, Llano
Mill Supt. Albert Fox
Cap: 180 tons of talc daily

SUNRISE MNG CO
708 Simons Bldg, Dallas, Texas
Pres. A P Simons
VP & Gen Mgr Edward A Mack
Purch Agt & Gen Supt: P G Mack
(See Ariz)

SUPERIOR INDUSTRIES, INC
303-11 Meadows Bldg, Dallas
Pres & Purch Agt. O T Bell
VP W C Maxey
Sec-Treas. Isaac Gibson
(See Ariz)

TERLINGUA MERCURY CORP
Jones Bldg or Box 330, Alpine
Pres. R A Wagner
VP & Treas: R N Pulliam
Sec: Percy D Williams
Asst Sec: L M Pullam
FRESNO MINE, SECTION 69 & 58
PROSPECTS, Terlingua, Quick Silver dist, undergr, Hg
Gen Mgr. R N Pulliam
Asst Gen Mgr. Joe R Rector
Asst Supt & Frm H B Turner
Consult Geol: A R Fletcher, Hay M Hammond
Prod: 30 tons & devel
ROTARY FURNACE, at Fresno Mine
Supt: L C Bradford

TEXAS GULF SULPHUR CO
New Gulf
Pres: F M Nelson
VP & Gen Mgr. C O Stephens
Sec. E F Van Der Stucken
Treas: E C Meagher
Purch Agt: R L Carter
Geol: Dr C F Fogarty
BOLING MINE, New Gulf, S
MOSS BLUFF MINE, Liberty, S
SPINDLETOP MINE, Beaumont, S undergr
Prod: S, 000 tons daily

UNITED STATES GYPSUM CO
300 W Adams St, Chicago 6, Ill
QUARRY & PLANT, New Braunfels, open pit, limestone
Works Mgr D J George
MINE & PLANT, Sweetwater open pit gypsum
Works Mgr T H Kaesner
(See Calif, Colo, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Utah, Va)

UTAH

A C D URANIUM & FERTILIZER
342 E 2nd North, Logan
LONE PINE MINE, Box Elder County, WO_3

ADELT, H I & NEBEKER, J H
226 S 3rd East St, Salt Lake City
BLACKHAWK 1 MINE, Tooele County, Ag, Pb, Zn

AETNA MNG & INVEST CO
333 Felt Bldg. Salt Lake City
Pres Leo Eagar
(See Bayhorse Mine, Inc, Idaho)

ALHAMBRA GOLD MINE CORP
1903 Outpost Dr Hollywood 28, Calif
400 LODE CLAIMS, Henry Mt dist, Garfield County U_3O_8
(See Calif, Nev)

ALTA UNITED MINES CO
Box 461, Salt Lake City
SOUTH HECLA MINE, Salt Lake County, Ag, Pb, Zn

AMALGAMATED TUNGSTEN INC
48 N 6th West, Salt Lake City
COPPER KING MINE, Millard County, WO_3

AMERICAN FORK CONSOL MINES
405 Dooly Bldg, Salt Lake City
Pres H G Blumenthal
VP N J Nielsen
Sec-Treas W J Robertson
Gen Supt: Leslie O Burnett
BLUE ROCK MINE, 20 mi NE of Pleasant Grove, undergr, Ag, Pb, Au
Under devel

AMERICAN GILSONITE CO
134 West Broadway, Salt Lake City
Pres E F Gardner
Prod Mgr: R E Nelson
Sec-Treas. E H Owen
BONANZA MINES, Bonanza, undergr, gilsonite
Gen Supt. Paul Borden
Mine Frm: Floyd Williams
Mine Eng: Richard Dewey
200-TON MILL, Bonanza, drying & sizing plant
REFINERY, Gilsonite
Under construction

AMERICAN LEDUC URANIUM CORP
200 N 6th, Grand Junction, Colo
PROPERTIES, Temple Mountain, Emery County and San Juan County
(See Colo)

AMERICAN SMELT & REFIN CO
700 Crandall Bldg, Salt Lake City 1
WESTERN DEPARTMENT
MINING DEPT
Mgr: F V Richard
Ch Geol: W R Landwehr
Mig Eng: Norman Weise
SMELTING DEPT
Gen Mgr: W G Rouillard
Asst Gen Mgr: R L Hensebach
Mgr, Garfield Pl. Kano Deerr, Jr
Accounting Mgr. R L Rigsby
Ore Buyer & Asst to Mgr R M McGeorge
Supply Agt: C W Frederiksen
In Chg Acid & Liquid SO_2 Dept: S D Williams
GARFIELD COPPER SMELTER, Garfield
Supt: R Thompson
Asst Supt: E V Hardy
(See Ariz, Calif, Colo, Idaho, Ill, Kans, Md, Mont, Neb, N J, N Mex, N Y, Tex, Wash, and Federal Mng & Smelting Co, Mo)

AMERICAN STAR MNG CO
908 Dooly Bldg, Salt Lake City
Pres: Cecil Fitch
VP: Cecil Fitch, Jr
Sec-Treas: W W Watson
AMERICAN STAR MINE, Eureka, Ag, Au, Cu, Pb
Geol: Max Evans
Mine Supt: Webster Brady
Under devel

AMERICAN SULPHUR REFINING CO
430 N Camden Dr, Beverly Hills, Calif
Pres: Thomas N Neale
VP: Henry H Wheeler, Sr
Sec-Treas: Henry H Wheeler, Jr
Dir of Sales: Wm N Neale
SULPHURDALE MINE, Sulphurdale, surface sulphur
Gen Supt. W D Maycock
Met: M J McIntosh
Elec Eng: Wm G Baldwin
Prod: 450 tons
450-TON MINN, at mine, solvent recovery
Ch Eng: M J McIntosh
SMELTER, at mine
30, 000 tons yrly

AMERICAN URANIUM
Box 594, Uranium Bldg, Moab
URANIUM PROPERTY, in Colorado

AMODT, A & WILLARD, L
Gold Hill
BUENA VISTA MINE, Tooele County, WO_3

ANACONDA CO, THE
(See subsid International Smelting & Refining Co, Ariz, Utah, and Anaconda Company, Calif, Idaho, Mont, Nev, N Mex, N Y)

ANDERSON, W B
430 E 1st North, Pleasant Grove
CLOUDBURST MINE, Utah County, Au

APEX DIXIE MINES INC
Box 748, St George
DIXIE-APEX MINE, Washington County, Cu

APEX TUNGSTEN MNG CO
1760 E Northern Ave, Phoenix, Ariz, c/o of J S and M S Babick
APEX-TUNGSTEN MINE, Juab County WO_3

ARROW URANIUM CORP
406 Judge Bldg, Salt Lake City
U_3O_8 Exploration

ARUNDEL MNG CO
Marysvale
DEER TRAIL LEASE, undergr Pb, Cu, Zn, Ag, Au
Gen Mgr E P Jones
Dir of Oper. Q F Treseder
Gen Supt. J G Sylvester
Mine Frm. Gerald Allen

ATLAS URANIUM CORP
511 Phillips Petroleum Bldg
Salt Lake City
URANIUM Prod

ATOMIC RESOURCES CORP
523 3rd N W, Albuquerque, N Mex
Pres: J V Reynolds
Treas. John R Lees
WATERFALL GROUP, P O Box 458, Monticello, Dry Valley, undergr & open pit, U_3O_8, V_2O_5
Gen Mgr. Carl Dismant
Prod: 100 tons
100-TON FLOT MILL, Dry Valley

BAMBERGER INV CO
163 S Main St, Salt Lake City
COPPEROPOLIS MINE, Tooele County, Cu

BAR X MNG CO
155 E 2nd S, Salt Lake City
ESTHER GROUP, Tooele County, Ag, Pb, Zn

BARROS, RICHARD
Box 504, Sunnyside
SILVER SPUR 1, Emery County, Au

BEATTY, HELENE E
Box 233-E, E Pasadena Station, Pasadena 8, Calif
GREAT WESTERN MINE, Iron County, Fe

BESTWALL GYPSUM CO
120 E Lancaster Ave, Ardmore, Pa
GYPSUM MINE
(See Iowa, Ky, Mich, N Y, Pa, Tex)

BIG HORN URANIUM CORP
c/o Keith B Redd, Monticello
Pres: Allan Egbert
VP: Morris Nelson
Sec-Treas: Frank Hammond
Gen Mgr: Keith B Redd
LOST BOY MINE, White Canyon dist, undergr, U_3O_8
Mine Frm: Max Edgel
Prod: 20-100 tons

BIG INDIAN URANIUM CORP
Box 111, Provo
Sec: Welby W Rices
BIG INDIAN MINE, San Juan County, Cu, U_3O_8

BINGHAM EMPIRE MNG CO
P O Box 37, 135 N University, Provo
VP: Philip S Knight
Sec-Treas: Richard Knight
MINE, Bingham Canyon, 20 mi SW of Salt Lake City, undergr, Cu, Pb, Ag
Idle

BLEAK URANIUM CO
47 N University, Provo
URANIUM Prod

BLUE CHIP URANIUM CORP
Denham Hall, Denver, Colo
URANIUM holdings, San Juan County, Monticello Mng dist

BLUE EAGLE MNG CO
149 S Second West, Tooele
Own: Leslie S Gillett
BLUE EAGLE 1, 2, 3 MINES, Tooele County, Ag, Pb, Zn

BLUE GOOSE MNG CO
Box 1055, Farmington, N Mex
LUCKY LADY CLAIMS, Circle Cliffs area, Garfield County, U_3O_8

BONNEVILLE, LTD
340 W 7th South St, Salt Lake City 4
Pres: W L Bradley
VP-Gen Mgr: L W Ferris
Sec: G B C Mathison
Treas: Robert Livermore
Purch Agt: W R Thomas
MINE, Wendover, KC1
1,000-TON FLOT MILL
Gen Mgr: L W Ferris
Asst Gen Mgr: O M Wiches
Gen Supt: Jessee V Ecton
Asst Supt & Mill Frm: J Rands Wiley
Met: D C Hunter
Chemists: Clyde Andrew, Hal C Ballard

JOHN BOUNDY & SONS
Montello, Nev
BIRD MINE, Box Elder County, WO_3
ROCKY PASS MINE, Box Elder County, WO_3

BOYLES BROS DRILLING CO
1321 S Main St, Salt Lake City
Pres: R T Goldsworthy
VP: H L Baker
Sec: A F Goldsworthy
Treas: V L Stevens
Purch Agt: A P Tweker
Comptroller: E D Haddox
ROYAL MINE (Joint venture with Royal Uranium Corp), Monticello, undergr, U_3O_8
Mine Supt: H K Robbins
Prod: 50 tons

BRADLEY & EDSTROM, INC
320 Market St, San Francisco, Calif
MINES, variety of minerals
(See Calif)

BRAY & McCLURE
Delta
E P H DUMP, Juab County, Cu

BRIDGER-JACK, INC
160 W Main St, Grand Junction, Colo
BRIDGER-JACK MINE, S of Moab, U_3O_8, V_2O_5
(See Colo)

BRISTOL SILVER MINES CO
218 Felt Bldg, Salt Lake City 1
Pres: George W Snyder
VP: Edward H Snyder
Sec-Treas: C M Christensen
(See Nev)

BRITISH WESTERN AMERICA URANIUM CORP
831 1st Security Bank Bldg, Salt Lake City
Pres: Henry Kyle
VP: George Barnes
Secs: I C Scott
(See Colo)

BROCKWAY, J D
Milford
IRISH, 3, 4, 5, 6 MINES, Beaver County, Ag, Pb, Zn

BROWN, N W
270 N 2nd West, American Fork
M & M MINE, Millard County, Ag Pb, Zn

CALERA MNG CO
(Subsid of HOWE SOUND CO)
Garfield
CHEM REDUC PLANT Garfield County
Supt: J S Mitchell
Ch Acct: W E Taylor
Res Supt: W D McIntyre
(See Idaho, N Y, & Howe Sound in Wash)

CAL URANIUM COMPANY
Box 1486, Casper
Pres: H O English
Sec-Treas: Louis England
MINE, SAN JUAN SHAFT, 35 mi SE of Moab, undergr U_3O_8
Idle

CANE SPRINGS URANIUM CORP
404 N 2nd St W, Salt Lake City
PROPERTIES & LEASES, San Juan County, U_3O_8

CAPITOL REEF URANIUM CO
Loa
PROPERTIES, Wayne & Garfield Counties, U_3O_8

CAPITOL URANIUM CO
Box 1647, Farmington, N Mex
Pres: Warren E Wiley
VP: Fred Carson
Sec-Treas: William A Pope, Jr
TAYLOR REID NO 1 MINE, Ojato, undergr, U_3O_8, V_2O_5
Mine Supt: Marshall J Fletcher
(See Ariz, N Mex)

CARDIFF MNG & MLG CO
704 Newhouse Bldg, Salt Lake City
CARDIFF MINE, Salt Lake County, Ag, Pb, Zn

CARISA GOLD MINES
Marysvale
CARISA MINE, undergr Au, Ag, Pb, Cu
Lessee: Lucy Deluke
Under devel
(Leased from Deer-Trail Mines, Marysvale)

CASEY, R L & PIERCE, A L
Box 220, Centerville
SILVER BELL MINE, Box Elder County, Au

CEDAR HILLS MNG CO
234 E 1st South St, Salt Lake City
IRIS MINE, Piute County, Au
SHAMROCK MINE, TUSHAR GROUP, Piute County, Ag, Pb, Zn

CENTENNIAL DEVEL CO
Eureka
Pres: Harold B Spencer
VP: James Quigley
Sec-Treas: Robert E Watt

CHESLEY & BLACK
Delta
FLUORINE QUEEN STRIP MINE, Juab County, CaF_2

CHIEF CONSOL MNG CO
608 Dooly Bldg, Salt Lake City
Pres & Gen Mgr: Cecil Fitch, Jr
VP & Sec-Treas: W W Watson
CHIEF NO 1, EAGLE, BLUE BELL, PLUTUS MINES, Eureka, undergr, Zn, Pb, Ag, Au
Mine Supt: Webster Brady
Geol: Max Evans
Prod: 125 tons

CIRCLE CLIFFS URANIUM CO
514 First Security Bldg
Salt Lake City
CLAIMS, Circle Cliffs area, U_3O_8

CLARIDGE, T A
Delta
BLOWOUT MINE, CaF_2

CLIFF DEVEL & EXPLOR CORP
4643 Hyland Dr, Salt Lake City
Pres & Gen Mgr W C Dunham
VP: Deloy Tanner
Sec-Treas: Doris T Dunham
SHOWER'S MINE, Silver City, undergr, Cu, Pb, Zn
Under devel

CLIMAX URANIUM CO
P O Box 1001, Grand Junction, Colo
VP & Gen Mgr A M Mastrovich
U_3O_8 Prod
(See Ariz, Colo, N Y)

COG MINERALS CORP
Denver Club Bldg, Denver, Colo
Pres: W C Norman
VP: J H Nason
Sec-Treas: D F Taylor
Purch Agt: T B Allred
SPOOK-BULLSEYE MINE, Fry Canyon via Blanding, undergr U_3O_8, Cu
Gen Mgr: Ross V Seeton, Jr
Geol: Clare Gregg & D F Spencer
Met: Frank A Seeton
Mine Supt: John P Briggs
Asst Mine Supt Kay Bradford
Mine Frm: Bill Moyle
Mine Eng Dell White
Prod: 140 tons
75-TON MILL Fry Canyon, upgrade-pilot plant
Mill Supt Frank A Seeton
Mill Frm Homer Dale
(See Colo)

COLLETT, CLARENCE J
4760 W 4985 South, Kearns
BLACKHAWK MINE, Tooele County, Ag, Pb, Zn

COLORADO CONSOL MINES CO
1114 Walker Bank Bldg, Salt Lake City
Pres H E Raddatz
VP Harriet D Travis
Sec Glen Hardy
Gen Mgr M D Paine
COLORADO CONSOLIDATED MINE, Dividend, 2 mi SE of Eureka undergr Pb, Au, Ag, Cu
Idle

COLORADO FUEL & IRON CORP
Cedar City
BLOWOUT & COMSTOCK MINES, Iron Mt surface, Fe
Res Eng John Robertson, Jr
Prod 4,000 tons
(See Colo, Wyo)

COLUMBIA IRON MNG CO
(Subsid U S STEEL CORP)
130 Montgomery St San Francisco Calif
Pres A G Rosch
VP L J Westhaver
Sec Thomas Ashby
Mgr, Raw Mat Devel R C Talbott
Ch Eng W F Pruden
Dir, Ind Rel & Safety C T Spivey
Dir of Purch H W Christensen
MINES, Iron Mtn & Desert Mound 20 mi W of Cedar City, surface, Fe
Gen Supt G D MacDonald
Mine Eng: J D Quinn
CRUSHING & SCREENING PLANTS, Desert Mount & Iron Mtn
(See U S Steel, Alaska, Ala, Calif Ky, Minn, Pa, Tenn, Utah, Wyo)

COMANCHE URANIUM CO
201 E 2nd S, Salt Lake City
CIE DOG CLAIM, Salt Valley area, Thompson Mng dist, Grand County, U_3O_8
CLAIMS, East Coyote Wash area, San Juan County, U_3O_8

COMBINED METALS REDUCTION CO
Box 190, Salt Lake City 10
Pres & Gen Mgr: E H Snyder
VP: W B Kelsey
Treas: O F Burton
Sec: C M Christensen
Purch Agt: E G Black
Ch Chem: H E Hansen
Research Met: Corwin Likens
Mech Eng: A L Schindler
Ch Elec Eng: John M Ridges
BAUER PLANT OPS: Stockton
Gen Supt, Utah Op: S E Craig
Pl Eng: I C Drouboy
Mine Supt: Lyman Moore
Mill Supt: Winford Hector
Chem: Elwin Elkington
Met Rex Hayes
Master Mech: Kenneth Stickle
Office Mgr Frank Andros
(See Nev)

COMMONWEALTH LEAD MNG CO
444 W Center St Provo
Pres Orvil J Coon
VP: Royal B Garff
Sec-Treas & Gen Mgr, Dean R Featherstone
Geol: Joseph W Neville, Jr
COMMODORE MINE, 10 mi SE of Stockton,
JUNIPER CLAIMS, 18 mi W of Moab, undergr: Pb, Ag, Zn, Cu, U_3O_8
(See Mont)

COMMONWEALTH MNG CO OF S D
Box 893, Sioux Falls, S D
COMMONWEALTH URANIUM NO 1 & 2, near Greenriver & near Moab undergr, U_3O_8
Gen Mgr Dewey O Ferguson (Ouray, Colo)
Under devel
(See S D)

COMSTOCK URANIUM & OIL CORP
311 Phillips Petroleum Bldg
Salt Lake City
Pres S A Walsh
VP Wm A Szarl
Sec-Treas L K Nicholson, Jr
Cons Geol J J Beeson
(See Nev)

CONGO URANIUM CO
404 Boston Bldg, Salt Lake City
URANIUM PROP, Henry Mts dist, Garfield County

CONGRESS URANIUM CORP
402 Darling Bldg, Salt Lake City
Pres Leo G Meredith
Sec-Treas Karl F Buell
(See Colo)

CONSOL EUREKA MNG CO
217 Kearns Bldg, Salt Lake City 1
Pres James E Hogle
VP J C Johnson
Sec-Treas L J Lerwill
Gen Mgr & Purch Agt Sherman B Rinehart
(See Nev)

CONSOL URANIUM MINES INC
430 S Main St. P O Box 2570
Salt Lake City
(See Colo, Nev)

CONTINENTAL URANIUM INC
430 S Ninth St P O Box 1804, Grand Junction, Colo
Pres Willard Gidwitz
Sec Max H Braun
Board Chmn Gerald Gidwitz
CONTINENTAL NO 1 Lisbon, undergr U_3O_8
Gen Supt C H Reynolds
Geol H M Smithson, Gerald Brooks
Met James C Ternahan, Jr
Mine Supt Clarence O Cox
Prod: 100 tons
(See Colo, & Woodmont, Inc, Utah)

COOK, B M & JENSEN A B
Box 86, Torrey
T R LODE 1, Wayne County, Cu

CROWN URANIUM CO
205 Star Bldg, Casper, Wyo
URANIUM PROP, Slick Rock Dist & Hitch Wash Canyon, U_3O_8
Geol Dave Coolbaugh
Under devel
(See Colo, Wyo)

CRUSADER OIL & URANIUM CO
1717 E Colfax Ave, Denver 18, Colo
URANIUM HOLDINGS, Utah
(See Colo, Wyo)

CULLEN MINERALS CORP
810 Rood Ave, Grand Junction, Colo
Pres: Lucien H Cullen
VP: K D Kausch
Sec-Treas: T H Tucker
ELIZABETH & FRISCO MINES, Box 506, Monticello, undergr, U_3O_8, V_2O_5
Gen Mgr: K D Kausch
Asst Gen Mgr: L G Petersen
Gen Supt: Fred Zanes

Mine Supt: Paul Alex
Prod: 20 tons (Ekxtech)
40 tons (Frisco)
(See Colo)

CURTIS URANIUM MINES
625 N 7th W, Provo
Own: M E Curtis
6 CLAIMS, SE of Circo, undergr, open pit, U_3O_8, V_2O_5
Under devel

D & B MNG CO
Box 155, Ridgway, Colo
Pres: J W Bradford
VP & Gen Mgr: E J Delpas
Sec-Treas: R W Bradford
WEE HOPE MINE, San Juan County, undergr, U_3O_8, Cu
Prod: 30-36 tons

DAVIS MNG CO
Provo
HARRISITE MINE, Juab County, CaF_2

DECKER, G P
Monticello
FOUR ACES MINE, San Juan County, Cu

DESERT MOUNTAIN MILLS INC
568 26th St, Ogden
FALKENBURG MINES, Juab County, WO_3

DISMANT, CARL
P O Box 458, Monticello
U_3O_8 Prod

DIVERSIFIED RESOURCES INC
201 N 5th, Grand Junction, Colo
CLAIMS, San Juan County
(See Colo)

DODGE URANIUM CORP
226 Majestic Bldg, Denver, Colo
STEAMBOAT MESA CLAIMS, Grand County, U_3O_8
Under devel
McCRACKEN WASH CLAIMS, Paradox Basin, San Juan County, U_3O_8
Drilling program
(See Colo)

DRAGON CONSOL MNG CO
c/o Ross Warburton, 646 Kearns Bldg, Salt Lake City
Pres: J Will Knight
VP: J J Lillie
Sec: Ross Warburton
Geol: M S Nikitin
Purch Agt: T K Davis
DRAGON MINE, 4 mi S of Eureka, undergr & surface, halloysite clay, Au
(Lessee: Filtrol, Inc, Salt Lake City)

EAGLE & BLUE BELL MNG CO
608 Dooly Bldg, Salt Lake City
EAGLE & BLUE BELL MINES, Juab County, Au

EL DORADO MNG CO
616 Newhouse Bldg, Salt Lake City
Pres & Gen Mgr: Whitney C Hansen
VP: Sherman Jensen
Sec: Alvin G Pack
Treas: Ivin O Nichols
CLAIMS, North Bingham, Indian Creek, San Juan County & Hedom Bench, Garfield County, undergr, U_3O_8
Under devel
EL DORADO MINE, Salt Lake County, undergr, Ag, Au, Pb, Zn
Geol: H E Hevenor
Supt: George Rhodes
Under devel

EL OPAL MNG
Box 1109, Moab
Pres: Donald F Lenox
VP: Buster Stewart
Sec: Mrs Lenox
YELLOW CIRCLE NO 151 MINE, undergr, U_3O_8, V_2O_5
Mine Frm: Frank Curley
Prod: 5 tons
DEEP BASIN GROUP

EMPIRE MINES CO
618 Kearns Bldg, Salt Lake City
SPY & BLACK JACK MINES, Juab County, Au

EUREKA LILLY CONS MNG CO
1114 Walker Bank Bldg, Salt Lake City 1
Pres: H E Raddatz
VP: Harriet D Travis
Sec: Glen Hardy
Gen Mgr: M D Paine
EUREKA LILLY MINE, Dividend, undergr, Au, Ag, Cu, Pb
Idle

EUREKA STANDARD CONSOL MNG CO
1114 Walker Bank Bldg, Salt Lake City
Auditor: Glen Hardy
EUREKA STANDARD & DUMP MINES, Utah County, Au

FAIRWAY URANIUM CORP
2320 S Main St, Salt Lake City
Pres & Gen Mgr: O C Larson
Sec: Kenneth Taylor
(See Idaho)

FEDERAL URANIUM CORP
P O Box 1317, 240 S Main St, Salt Lake City
Pres: R W Neyman
VP: Lester S Harrison
Sec-Treas: C Allen Eliggren
Purch Agt: Grant F McGowan
VARIOUS MINES, U_3O_8, Ag, Pb, Zn, Cu
Gen Supt: Lee Messerly
Geol: L G Thomas
Mill Supt: Arthur Griffiths

FIVE STATES URANIUM CO
Simms Bldg, Albuquerque, N Mex
DIRTY DEVIL CLAIM, Emery County, U_3O_8
CLAIMS, Tomich Mountain, Emery County, U_3O_8

FOUR CORNERS URANIUM CORP
633 Guaranty Bank Bldg Denver, Colo
GREEN RIVER GROUP (5 MINES)
Green River, U_3O_8
Gen Mgr: W R Bronson, Monticello
(See Colo)

FRAZIER & KILLION
Box 201, Montello, Nev
COPPER MTN MINE, Box Elder County, Cu

FRISCO SILVER LEAD MNG CO
39 Exchange Place, Salt Lake City
Pres: Paul H Hunt
Sec: David H Bullough
MINE, 25 mi W of Milford, undergr
Idle

GARFIELD CHEMICAL & MFG CO
700 Crandall Bldg, Salt Lake City
Pres: Kuno Doerr, Jr
VP: L P Pett, P C Green
Sec-Treas: R L Rigsby
Purch Agt: C W Frederiksen
1,000-TON SULPHURIC ACID PLANT
Garfield
Mgr, Acid & Liquid SO_2 Dept: R D Williams
Supt: A S Neslen

GARRICK, LOUISE W & DAVID J
440 S 6th East, Provo
SHELITE QUEEN, Millard County, WO_3

GERONIMO URANIUM MNG
345 S State St, Salt Lake City
EAGLE NO 2 & 7 CLAIM, U_3O_8
Drilling
PARROT CLAIM, U_3O_8
Limited prod
(See Colo)

GIGGEY, ELMER A
Vernal
DYER MINE, Uintah County, Cu

GODIVA MNG & MLG CO
c/o Walker Bank & Trust Co
Salt Lake City
GODIVA MINE, Juab County, Au

GOLD CLOUD URANIUM INC
218 Felt Bldg, Salt Lake City
U_3O_8 Prod

GOLD HILL EXPLOR CO
Gold Hill via Wendover
Gen Mgr: C R Woodman
YELLOW HAMMER MINE, Tooele County, WO_3, Cu
WOODMAN MILL

GOLDEN EAGLE MNG CORP
1625 Maple Court Ave, P O Box 1567, Grand Junction, Colo
Pres: Worth W Offutt
VP: L P Laddusaw
Sec-Treas: H E Bell
ROC CREEK MINE, 14 mi NW of Uravan, undergr, U_3O_8, V_2O_5
Gen Supt: Ralph Ramsey
Under devel

GRAMLICH EXPLOR CO
Box 435, Moab
Pres & Gen Mgr: J W Gramlich, Sr
VP & Asst Gen Mgr: J W Gramlich, Jr
Sec-Treas & Gen Supt: Philip F Gramlich
BLUE JAY & SAN JUAN MINES, undergr, U_3O_8, V_2O_5
Geol: Duff Ebbley
Mine Eng: Hub Newell
Under devel

GRAND DEPOSIT MNG CO
409 Ness Bldg, Salt Lake City 1
Pres: Paul C Lyon
VP: Walter J Eldridge
Sec: Paul C Lyon, Jr
(See Nev)

GREAT WESTERN MINES CO
136 N University Ave, Provo
VP: Philip S Knight
Sec-Treas & Gen Mgr: Richard Knight
BIG COTTONWOOD, LITTLE COTTONWOOD MINES, Snake Creek, American Fork Mng dist, undergr, Cu, Au, Ag, Pb
(Under lease to West Park Mng Co)

GREEN HORN SILVER MNG CO
Marysvale
Own: Louis C Deluke
MINE, Marysvale, undergr, Pb, Zn, Au, Ag, Cu
Under devel

GREEN RIVER OIL & URANIUM CO
26 W Broadway, Salt Lake City
Pres: Fallas M Kelly
Sec-Treas: Austin B Smith
(See Colo, Wyo)

GRIGGS & CHOURNOS
Box 236, Montello, Nev
LONE PINE MINE, Box Elder County, WO_3

GULF MINERALS CO
2121 S State, Salt Lake City
Pres: W K Whiteford
VP: Blaine B Wescott, R D Wyckoff
Ch: R E Lehner

GUNSITE BUTTE URANIUM CORP
36 W Broadway, Salt Lake City
Pres: Milton V Hackman
VP: Claude Lacy
Sec: M J Florance
Treas: Nick Vrontikis
(See Ariz)

HALDANE & JONSON MNG CO
1037 Ouray Ave, Grand Junction, Colo
Partners: W E Haldane, O E Jonson
PROFIT MINE, East Canyon, San Juan County, undergr U_3O_8, V_2O_5

HAMILTON, RALPH
Caliente, Nevada
O K MINE, Beaver County, Au

HAMPTON MNG CO
c/o Stanford R Mahoney, 502 Atlas Bldg, Salt Lake City
SILVER EAGLE MINE, Tooele County, Ag, Pb, Zn

HARDROCK MNG SYNDICATE
139 N Virginia St, Reno, Nev
VISTA GRANDE GROUP, White Canyon area, San Juan County, U_3O_8

HARRINGTON MINES CO
c/o Jack Hanley, Jr, Milford
HARRINGTON-HICKORY GROUP, Ag, Pb, Zn

HECLA MNG CO
Moab
RADON MINE, near Moab, undergr, U_3O_8
Mine Supt: Philip Lindstrom
Prod: 25 tons
(See Idaho)

HIDDEN SPLENDOR MNG CO, THE
First Security Bldg, Salt Lake City
Pres: Floyd B Odlum
VP: David A Stretch
Sec-Treas: Edward R Fabley, Jr
Purch Agt: Jack E Hopfenbeck
Gen Mgr: Otto D Rohlfs, Jr
Gen Supt: Kenneth A Nobe
Asst Gen Supt: Ray L Schultze
Ch Geol: William B Loring
Ch Eng: E T Wood
DELTA MINE, Muddy River, Emery County, undergr, U_3O_8
Mine Supt: John R Mullen
Mine Frm: Albert P Edwards
Prod: 3,000 tons per month
FAR WEST, Big Indian Wash, San Juan County, undergr, U_3O_8
Mine Frm: Fred Johnson
Mine Eng: Richard B Nelson
Prod: 8,000 tons per month

HILL TOP MNG CO
c/o W D Hamblin, 45 E Center St, Kaysville
HILL TOP MINE, Juab County, CaF_2

HOMESTAKE MNG CO, UTAH DIV
100 Bush St, San Francisco, Calif
ALICE PROPERTY, Box 563, Moab
undergr
Supt: Donald T Delicate
Asst Supt: Gordon M Miner
Engr: Paul Jones
(See Calif, S D, Wyo)

HORN SILVER MINES CO
39 Exchange Place, Salt Lake City
Pres: P H Hunt
Sec-Treas: D H Bullough
HORN SILVER MINE, Milford, Au, Ag, Pb, Zn

HORSETHIEF CANYON URANIUM INC
930 E 3rd S, Salt Lake City
Pres: Chester M F Peters
VP: James L Knowlden
Sec: Jessie M Peters
Treas: Eugene Moench
HORSETHIEF CANYON MINE, Green River area, undergr, U_3O_8, V_2O_5
Gen Mgr: C M F Peters
Under devel

HUNT, KAY
Hanksville
KING GROUP, U_3O_8

HUNT OIL CO
Grand Junction, Colo
DRILLING, La Sal Creek, U_3O_8
Under devel
THORNBURG LEASE, U_3O_8
Under devel
(See Colo)

HUNT URANIUM CORP
Hanksville
Pres: Andrew Hunt
VP & Gen Mgr: Ray Hunt
Sec & Geol: Rio Hunt
Treas & Asst Mine Supt: Loyd Hunt
POISON SPRINGS MINE, undergr, U_3O_8, Cu
Under devel

HYPOTHEEK MNG & MLG CO
510 Bank St, Wallace, Idaho
CLAIMS, U_3O_8
(See Idaho, Mont, Wash)

I X L URANIUM CORP
c/o Earl J Clinger, Box 308, Provo
IXL MINE, Tooele County, Au

IBEX GOLD MINING CO
136 N University Ave, Box 37, Provo
VP: Philip S Knight
Sec-Treas & Gen Mgr: Richard Knight
IBEX MINE, (Leased), near Delta, in Drum Mt dist, undergr, Cu, Au, Ag
Prod: 10 tons

IDAHO-MARYLAND MINES CORP
P O Box 1038, Grass Valley, Calif
URANIUM PROP, Moab area
Explor
(See Calif)

IMPERIAL URANIUM CORP
623 Judge Bldg, Salt Lake City
CLAIMS, Red Canyon area, San Juan County, and Claims near Mite, U_3O_8
Under devel

INDEX-DALEY MINES CO
116 N Main St, Salt Lake City
Pres & Gen Mgr: Charles S Woodward
VP: Glen A Finlayson
Sec-Treas: R W Edmunds
(See Nev)

INDIAN CREEK URANIUM & OIL CORP
2320 S Main St, Salt Lake City
Pres: O C Larson
VP: Kenneth Taylor
Sec: Preston W Frame
Treas: D W Richards, Jr
Purch Agt: O C Larson
BONANZA-CUTLER MINE, Monticello, undergr, U_3O_8
Gen Mgr: O C Larson
Supt: L W Reiter
Geol: Geo B Guillotte
Under devel

INDUSTRIAL URANIUM CO
720 Newhouse Bldg, Salt Lake City
Pres: Robert M Schubach
VP in Chg of Oper: Robert G Harding
Sec-Treas: Wilford M Burton
MOONLIGHT MINE, P O Box 561, Monticello, undergr, U_3O_8, V_2O_5
Mine Supt: Arthur O Wilson
Mine Frm: William D Jarvis
Prod: 150 tons

INDUSTRIES & MINES INC
89 Broad St, New York 4, N Y
DEL MONTE, DAISY JUNE, CONGRESS, EAGLES & CHIEF MINES, Henry Mts, undergr & surface, U_3O_8, V_2O_5, Au, Cb, Ta
Gen Mgr: James M Knapp
Asst Gen Mgr: Alexandre Cesar
Geol: Stuart St Clair
Mech Eng: Wm Kessen
Prod: 1,500 tons & developing
(See N Y)

INSPIRATION LEAD CO, INC
P O Box 178, W 909 Sprague Ave, Spokane 10, Wash
PROPERTIES, Brumley Ridge, E of Moab, Grand County, U_3O_8
CLAIMS, W of Blanding, Big Indian dist, San Juan County, U_3O_8
Explor
(See Idaho)

INTERMOUNTAIN TUNGSTEN MNG CO
Delta
YELLOW BIRD MINE, Millard County, WO_3

INTERNAT'L SMELTING & REFINING CO
(Subsid of THE ANACONDA CO)
818 Kearns Bldg, Salt Lake City
Gen Mgr, Utah Oper: F A Wardlaw, Jr
MILL & SMELTERS, near Tooele
Tooele Pl Mgr: Carlos Bardwell
Gen Supt: W J McKenna
Purch Agt: T K Davis
Asst Gen Mgr: E W Steinbach
Lead Pl Supt: T W Saylor
Concen Supt: R V Kettner
Met: O E House
Sample Mill & Surface Supt: J W Morgan
Ch Chem: D H Kuester
Safety Eng: T K Voyer
(SMELTERS & REFINERY)
(See Ariz)

ISBELL CONST CO
Box 2351, Reno, Nev
HAPPY JACK MINE, open pit, U_3O_8
Contract mng for Texas-Zinc Minerals Corp
Supt: R L Hoover
(See Calif, Nev, Wash)

J D W MNG & EXPLOR CO
c/o Jack Allsop, Smithfield
SUNSET MINE, Box Elder County, Au

J & J URANIUM CO
c/o George B Jackson, Price
LEO J MINE, U_3O_8

JENKINS, ELMER
3238 Grant Ave, Ogden
MINE, Juab County, WO_3

JOHNSON, VERN
450 E 8th South St, Salt Lake City
SILVER LILLY MINE, Tooele County, Ag, Pb, Zn

JOLLY JACK URANIUM
623 Judge Bldg, Salt Lake City
PROPERTIES, White Canyon area U_3O_8

K & S URANIUM INC
6 Kerby Bldg, Moab
WHITE CANYON PROPERTIES, San Juan County, U_3O_8

KACHINA URANIUM CORP
276 S W Temple, Salt Lake City
Pres & Gen Mgr: Carl C Adair
VP: Geo R Adair
Sec: Verl W Adair
(See Ariz)

KANE CREEK URANIUM CORP
P O Box 535, Riley Bldg, Moab
Pres: Ed Baird
VP & Gen Mgr: Walt Snyder
Sec-Treas: R J Pellmeth
RED ANT MINE, Slick Rock Mng dist, undergr, U_3O_8
Prod: 50 tons

KAYSVILLE URANIUM, INC
P O Box 156, Kaysville
Pres: Leonard L Wilkerson
VP: H P (Jim) Gauker
Sec: Lyle F Watton
Treas: Donald B Avery
Ch of Bd: Paul Ferguson
BYWATER ADIT, 4 mi E of Kaysville, undergr, open pit, U_3O_8
Idle
500-TON FLOT-GRAV & PRECIP MILL, 3 mi E of Kaysville
STRAWBERRY MINE, Davis County, Cu

KENNECOTT COPPER CORP, UTAH COPPER DIV
P O Box 1830, Salt Lake City 13
Gen Mgr, Utah Copper Div: L F Pett
Asst Gen Mgr, Utah Copper Div: F C Green
Gen Supt of Oper, Utah Copper Div: J C Landenberger
Dir of Labor & Personnel: E C Simkins
Dir, Indus Rel: D C Houston
Dir, Labor Rel: D O Olsen
Dir, Pub Rel: R W Aldrich
Div Comptroller: J P O'Keefe
Asst Div Compt: O C Madsen
Ch Mine Acct: S W Jacques
Ch Mill Acct: C B Brooks
Storekeeper, Mill: G H Kavanagh
Storekeeper, Mine: A J Boberg
Ch Refinery Acct: H L Erickson
Ch Eng: R P Anderson
Master Mech, Mine: S A Gudmundsen
Gen Master Mech, Mills: L Baldee
Master Mech, Magna: W L Hendrickson
Master Mech, Arthur: J W Ledingham
Traffic Mgr: A L Pratt
CENTRAL POWER STATION, Garfield
Ch Eng: J N Harkins
MILLS ORE HAULAGE, Garfield
Supt: L S Mills
BINGHAM MINE, Bingham Canyon, Cu
Mine Supt: V S Barlow
Asst Mine Supts: J A Norden, Jr, Ray F Gough
Employment Dir: L O Hamlin
Safety Eng: Ross Pino
MAGNA & ARTHUR MILLS, Garfield
Gen Supt: P H Ensign
Supt, Magna: T J Hubbard
Supt, Arthur: C G Quigley
Asst Supt, Magna: T J Barker, Jr
Employment Dir: M A Moffat
Ch Elec Eng: R J Corfield
Safety Eng: R L Erickson
Ch Met Eng: A G Johnson
Ch Anal Chem: V A Fraser
UTAH REFINERY, Garfield
Supt: H A Shaw
Asst Supt: K H Koropp
Met Eng: C A Zeldin
Plant Elec: I G Salisbury
Master Mech: R P Johnson
GARFIELD WATER & IMPROVEMENT CO, Garfield
Supt: C R Naylor
(See Ariz, Nev, N Mex, N Y)

KENO MNG & MLG CO
135 N University Ave, Box 37
Provo
VP: Philip S Knight
Sec-Treas & Gen Mgr: Richard Knight
IBEX MINE (Leased), Detroit Mng dist, north end of Mineral Mt range, undergr, Ag, Pb
Prod: 30 tons

KINGDOM URANIUM & MNG CO
611 Denham Bldg, Denver, Colo
STAR, FRACTION, & ZEPHYR LEASES, San Juan County, U_3O_8
TERRY LEE & JANE ELLEN CLAIMS, Lockhart Basin area, San Juan County, U_3O_8

KNAPP URANIUM DEVEL
555 E 3600 S, Salt Lake City
MINE & CLAIMS, White Canyon area, San Juan County, U_3O_8
SANDY GROUP, near Blanding, U_3O_8

KNUDSON, EARL J
450 S Main St, Salt Lake City
FOUR METALS MINE, Tooele County, Ag, Pb, Zn

LA FORTUNA URANIUM MINES, INC
521 E 5th St, Salt Lake City
URANIUM Prod

LAKESIDE MONARCH MNG CO
Box 743, Moab
Pres: Mitchell M Williams
VP: Robert E Mohler
Sec-Treas: Ellis R Cook, Jr
ALLEN 2 MINE, Red Canyon, San Juan County, undergr, U_3O_8
Lessee & Gen Mgr: Nate Knight
Field Eng: Everett Blackburn
Under devel

LAMBERT, D D
Heber
GREEN MONSTER MINE, Wasatch County, Cu

LA SAL MNG & DEVEL CO
Box 563, Moab
LA SAL MINE, Big Indian dist, San Juan County, undergr, U_3O_8
Supt: Donald T Delicate
Asst Supt: Gordon Miner
Frm: Donald Weierman
Mine Eng: Paul Jones
Prod: 210 tons

LA SALLE MNG
P O Box 217, Grand Junction
Colo
U_3O_8 Prod
(See Colo)

LA SHUBERCO MNG CO
Box 303, Marshfield, Wis
Pres: Grant Johnson
VP: W W Mittelstadt
Sec: Fred Wolf
Treas: Don Hosek
LITTLE EVA MINE, Yellow Cat dist, Grand County, U_3O_8, V_2O_5

LEE & SMALL MNG
135 S 3rd St W, American Fork
Part: Stewart C Lee, U A Small
(See Colo)

LELIA & MUSICK
10637 Spry St, Norwalk, Calif
APEX SMELTER DP, Washington County, Cu

LICHFIELD, WM H
447 S 5th East, Salt Lake City
MANGANESE Prod

LISBON URANIUM CORP
First Security Bldg, Salt Lake City
IKE & NIXON CLAIMS, Big Indian dist, U_3O_8
JUDY LEE & PATTI ANN CLAIMS, 1 mi N of Ike & Nixon Claims, U_3O_8

LISBON VALLEY URANIUM CORP
501 Kittredge Bldg, Denver, Colo
MASSEY & "C" GROUP MINES, Colorado-River area, San Juan County, U_3O_8

LITTLE BEAVER MNG CO, INC
Box 563, Moab
Pres: Donald H McLaughlin
LITTLE BEAVER MINE, Big Indian dist, San Juan County, undergr, U_3O_8
Supt: Donald T Delicate
Asst Supt: Gordon M Miner
Frm: Frank Bezzic
Mine Eng: Paul Jones
Prod: 100 tons

LOST CANYON URANIUM & OIL CORP
918 Simms Bldg, Albuquerque
N Mex
8 CLAIMS, Grand County, U_3O_8

LUCKY LAKE URANIUM INC
201 Boston Bldg, Salt Lake City
URANIUM CLAIMS, in Colorado

MALCO EXPLOR CO, INC
(Formerly Uranium Corp of America)
Monticello
Gen Mgr: Malcolm I Cole
LULU NO 1 MINE, Monticello, undergr U_3O_8, V_2O_5
Mine Supt: A F Pritchett
Geol: Harrison F Murray
Prod: 10 tons
44 CLAIMS, Wayne County, near Torrey, and Indian dist, San Juan County, U_3O_8
Explor
(See Colo, N Mex)

MAMMOTH MNG CO
Mammoth
Mgr: E S McIntyre
MAMMOTH MINE, Tintic dist, Juab County, Au

MARCY EXPLORATION & MNG CO, INC
1001 1/2 N Main Ave, Durango, Colo
Pres & Gen Mgr: S Stokes Tomlin, Jr
VP & Geol: E M Barge
Sec: R M Schell
Treas: Robert R Snodgrass
NOTCH NO 4 MINE, W of Blanding, undergr, U_3O_8
Prod: 15 tons
(See Ariz)

MARTIN, P S
Millard
LAST CHANCE MINE, Beaver County, Ag, Pb, Zn

MASCOT MINES, INC
Box 989, Kellogg, Idaho
Pres: Malcolm C Brown
VP & Purch Agt: Dunham Bell
Sec-Treas: H F Magnuson
COLORADO RIVER MINE, Box 985, Moab, Hatch Point, San Juan County, undergr, U_3O_8
Gen Mgr: Claude Nugent
Mine Supt: Inar Norgaard
Prod: 5 tons
(See Idaho)

MAYDAY URANIUM CO, INC
104 Harvey Bldg, Salt Lake City
BUTLER WASH, SWELL, & LIZARD CLAIMS, near Dry Mesa, U_3O_8

McFARLAND & HULLINGER
Box 238, Tooele
Partners: F G McFarland, S R Hullinger
OPHIR UNIT, Tooele County, Zn
MAYBE MINE, White Canyon dist, San Juan County, U_3O_8
(See Ariz)

MECCA MNG CO
704 Newhouse Bldg, Salt Lake City
MECCA GROUP, Tooele County, Ag, Pb, Zn

MEDICINE BOW URANIUM CO, INC
2124 S 30th East, Salt Lake City 6
Pres & Gen Mgr: J B Ferre
VP: James B Potter
Sec-Treas: Lionel J Bradford
KIA DOG MINE, undergr, open pit, U_3O_8, V_2O_5
Geol: Leland Davis
Elec Eng: L G Leon
Mech Eng & Mine Frm: Lionel J Bradford
Mine Supt: James B Potter
Under devel
(See Wyo)

MELLAN, D R
731 W 13th Soul, Salt Lake City
DULL DOG 1, Washington County, Cu

MELVILLE, ROY
Fillmore
SILICA PLUG MINE, Millard County, Au

METAL QUEEN MNG CORP
c/o E C Berry, Grantsville
METAL QUEEN GROUP, Tooele County, Au

MICHIGAN UTAH CONSOL MINES CO
417 Beason Bldg, Salt Lake City 1
Pres: De Witt Van Evera
Sec-Treas: Rynier Van Evera

MID CONTINENT URANIUM
201 Uranium Center Bldg
Grand Junction, Colo
JOHN INCLINE MINE, Thompson Yellow Cat dist, Grand County, U_3O_8, V_2O_5 (Leased to Lewood H Wilkerson, P O Box 3, Thompson)
Prod: 5 tons
(See Colo, N Mex)

MID STATE DEVEL CO INC
Box 561, Modesto, Calif
NEW KLONDIKE MINE, Millard County, WO_3

MINERAL HILL URANIUM EXPLORATION CO
424 - 3rd St South, Nampa, Idaho
Pres: S S Merrill
VP: Ralph Dye
Sec-Treas: Doris Wehlgamuth
URANIUM Prod

MINERAL MNG CO, INC
Box 361, Blanding
CHANNEL MINE, Red Canyon
White Canyon dist, San Juan County, undergr, U_3O_8, Cu
Gen Mgr & Supt: Bill Franklin
Asst Mgr & Supt: Clarke P Yeager
Geol & Eng: Wm H Greever
Trans: Robert Skaggs
Prod: 100 to 125 tons
RED BOX MINE, Ferreeville, Fry Canyon, U_3O_8, Cu
Gen Mgr: Kenneth L Franzen
Supt: Willard Edwards
Eng: Wm H Greever
(See N D)

MINERALS CORP OF AMERICA
204 N 5th, Grand Junction, Colo
CLAIMS, Thompson Mng dist, Grand County
CLAIMS, Yellow Cat area
CLAIMS, San Rafael dist, near Green Riv, Emery County, U_3O_8

MINERALS ENGR CO
801 4th Ave, Grand Junction, Colo
CHEM REFINERY, Salt Lake City
Mgr: Blair T Burwell
Supt: B T Buttolph
Output: 3,700,000 lbs yrly
(See Colo, Mont, Nev)

MOAB DRILLING CO
52 E Central St, Moab
Pres: Charles Steen
Gen Mgr: William N Lewis
DIAMOND DRILLING

MOAB MINES, INC
Box 586, Moab
Pres & Gen Mgr: Wm J Owen
VP & Asst Gen Mgr: Wm R Ellis
VP: S A Constantino, Jr
Treas: Leonard Fox
Purch Agt: Evaleen Nault
HUMBUG MINE, East Canyon, San Juan County, undergr, U_3O_8
Supt: Charles Aplanalp
Asst Supt: Frank Krajac

MOAB URANIUM CO
208 Uranium Center Bldg, Grand Junction, Colo
Pres: Joe Kejr
Exec VP: C M Hickman
Sec: James W Owens
Treas: Wm Coleman
Geol: Robert Norman & Wm Owen
RIMROCK CLAIMS, Montezuma Canyon, 13 mi SE of Monticello, U_3O_8

MONOGRAM URANIUM & OIL CO
214 Petroleum Bldg
Grand Junction, Colo
Pres: Ray Baxter
VP & Treas: Geo Dilts
Sec: Edward Nevano
DESERT MOON MINE, Green River, undergr, U_3O_8, V_2O_5
Mine Supt: Joseph M Trudgeon
Prod: 35 tons
(See Colo)

MONTE CRISTO URANIUM CORP
1101 Continental Bank Bldg
Salt Lake City
Pres & Treas: Richard Minasian
VP: Dement Neilson
Sec: Clarence C Nealon
HONEY BEE MINE, Cane Springs Canyon, San Juan County, undergr, open pit, U_3O_8, V_2O_5
(Oper under lease by the Skidmore Mng Co of Delores, Colo)

MORENO URANIUM CORP
731 Cooper Bldg, Denver, Colo
Pres: Dr Edward L Clark
VP: Howard Baisley
Sec-Treas: Ray Bennett
FRISCO MINE, ZANNETT LEASE, Moab, undergr, U_3O_8, V_2O_5
Asst Gen Mgr: Fred Zannett
Prod: 15 tons
(See Colo)

MOUNT PEALE URANIUM CORP
343 S State St, Salt Lake City
Pres & Gen Mgr: Elmer Strand
VP: F Guy Wilson
Sec-Treas: Jim E Jinks

MOUNTAIN MINERALS INVEST CO
Congress Hotel, 2nd S & State
Salt Lake City
POCO BUENO MINE, Tooele County, WO_3, Ag, Pb, Zn

MOUNTAIN TOP MNG & MLG CO
150 Colorado Ave, Grand Junction, Colo
LEASES, San Juan County, U_3O_8
(See Colo)

MOUNTAIN VIEW MNG CO
616 Kearns Bldg, Salt Lake City 1
MT VIEW GROUP (MAY DAY & HUMBUG), Au

NEBEKER, SCOTT M
Richfield
GOLD KING and others, Sevier County, Au

NELSON, L O
Delta
IBEX MINE, Juab County, Cu

NEVADA PARK MNG CO
P O Box 37, Provo
VP: Philip S Knight
Sec-Treas & Gen Mgr: Richard Knight
MINE, under, Au, Ag
(See Nev)

NEWMONT EXPLOR CO
(Subsid of NEWMONT MNG COR)
300 Park Ave, New York 22, N Y
EXPLORATION
(See N Y)

NEW PARK MINING CO
901 Walker Bank Bldg, Salt Lake City
Pres & Gen Mgr: W H H Cranmer
VP & Mgr of Oper: Clark L Wilson
Sec: Robert L Cranmer
Treas: R C Wilson
Purch Agt: Carl D Harper
MINE, Keetley, undergr, Au, Cu, Pb, Zn
Gen Supt: Gale A Hansen
Mine Frm: Delbert Ryan
Geol: Walter E Bauer
Prod: 200 tons

NEW QUINCY MNG CO
522 Felt Bldg, Salt Lake City
Sec: Glen I Crandell
J.I.C. MINE, Summit County, Ag, Pb, Zn

NEW-SHAT-TEX CO
626 Rood Ave, Grand Junction, Colo
Pres: Thomas Bardon
VP: Dr Gerhard Herzog
F J Malort
Sec: Robert A Oberfell
Treas: S T Crossland
URANIUM EXPLOR

NEW SUNBEAM MNG CO
1017 Kearns Bldg, Salt Lake City
SUNBEAM MINE, Juab County, Cu

NEW WORLD EXPLOR, RESEARCH & DEVEL CORP
6547 Aqueduct Ave, Van Nuys, Calif
EMPEY MINE, St George, undergr, U_3O_8
Under devel
(See Calif, Colo)

NORBUTE CORP
Uranium Center Bldg, Grand Junction, Colo
Mgr, Western Mng Div: Abbott Charles
RINGTAIL MINE, 9 mi from Thompson, Grand County, undergr, U_3O_8
(See N Y)

NORTH AMERICAN URANIUM & OIL CORP
Kittridge Bldg, Denver 2, Colo
CLAIMS, Big Indian dist, San Juan County, U_3O_8

NORTH BINGHAM MNG CO
135 N University Ave, Provo
VP: Philip S Knight
Sec-Treas & Gen Mgr: Richard Knight
MINE, Barney's Canyon, Bingham Mng dist, undergr Pb, Ag, Zn, Cu
Under devel

NORTH STANDARD MNG CO
Box 600, Provo
Pres & Gen Mgr: Garth W Monson
Sec: A W Clyde
(See Colo, Nev)

NORTH STAR METAL MINES, INC
612 Hamm Bldg, St Paul 2, Minn
Pres: John Moren
Exec VP: Herbert Gerber
Sec-Treas: Fred Schmalz
VP: M E Hofman
NORTH STAR & OLD HICKORY MINES, Milford, undergr, surface, WO_3, Cu, Ag, Au, Fe, U_3O_8
Prod: 300 tons
500-TON FLOT MILL, at mine
Supt: George Bush
Mill Mgr: Keith Long
LEACHING PLANT, at mine

OLD TEXAS MNG CO
Box 502, Moab
SHADOW MINE, Yellow Circle area, SW of Moab, U_3O_8

OL JATO URANIUM CO
114 Atlas Bldg, Salt Lake City
Pres & Gen Mgr: Max K Mangum
VP: Owen W Bunker
Sec-Treas: Karl F Buell
LONE BUTTE MINE, White Canyon area, San Juan County, U_3O_8
Prod: 45 tons

OLYMPIC URANIUM CO
39 Exchange Pl, Salt Lake City
DWYER CLAIMS, Salt Lake County, Ag, Pb, Zn, U_3O_8

PACK, LEON B
Box 73, Vernal
COPPER CROWN MINE, Uintah County, Cu

PAGE, DUKE
Spanish Fork
PAGE GROUP, EVELYN MINE, Juab County, Ag, Pb, Zn

PEARL PHOSPHATE CO
153 N Willow Ave, West Covina, Calif
STRIP MINE, Rich County, phosphate

PENROSE URANIUM CO
701 Midland Saving Bldg, Denver Colo
Pres: F N Bosco
CLAIMS, various parts of Utah
(See Colo)

PICK MNG CO
P O Box 67, Saratoga, Calif
Own: Vernon J Pick
MINE, U_3O_8
Gen Mgr: John M Barry
Controller: Robert H Martin
Ch Geol: Leo J Miller
Mine Supt: LeRoy E T Tyler

PIUTE URANIUM CORP
39 Exchange Place, Salt Lake City
Pres: P H Hunt
VP & Sec: D H Bullough
Treas: D H Bullough
PROPERTIES, Beaver County, Pb, Zn

PLATEAU MNG CO
Box 307, Moab
Pres: W D'Nebeker, Jr
VP: C Ed Flandro
Sec-Treas: Maxwell Bentley
Purch Agt & Gen Mgr: N Richard Seely
YELLOW CIRCLE MINE, undergr, U_3O_8, V_2O_5
Prod: 20 tons

PLUTUS MNG CO
608 Dooly Bldg, Salt Lake City
Pres: Cecil Pitch
VP & Gen Mgr: Cecil Pitch, Jr
Sec & Purch Agt: W W Watson
PLUTUS MINE, Eureka, undergr, Ag, Pb, Au
Geol: Max Evans
Mine Supt: Webster Brady
Prod: 25 tons

PRICE, L J
Box 387, Denta
BLACK BOY MINE, Juab County, Mn
DYKE MINE, Millard County, Mn

PRIVATEER MNG CO
Box 111, Provo
LITTLE EVA MINE, Juab County, Pb, Zn

PROSPER MNG CO
Milford
Pres: A M Besler
PROSPER MINE, Beaver County, Au

PRYOR MNG CO
Box 63, Billings, Montana
Uranium prod

PYRAMID URANIUM, LTD
606 Rood Ave, Grand Junction, Colo
Gen Part: K Dean Butler
4 MINES, Cottonwood Wash, San Juan County, 15 mi W of Blanding, U_3O_8
(See Colo)

RADIO GEOPHYSICAL CO
Transit Tower, San Antonio, Tex
CLAIMS, Elk Ridge, White Canyon area, San Juan County, U_3O_8
PROPERTIES, Blanding area
Explor

RADIUM HILL URANIUM CORP
Nye Bldg, Montrose, Colo
Pres & Gen Mgr: Homer Noble
VP: Willard Leighton
Sec: Corwin Palmer
UTAH NO 1 MINE, Monument Valley, undergr, U_3O_8, V_2O_5
Gen Supt: Bruce Hardman
Prod: 40 tons
(See Colo)

RAINBO GOLD MINES CORP OF DELAWARE
Marysvale
Pres: Louis C Deluke
VP-Sec: Lucy Deluke
Treas: A Paul Deluke
COPPER BELT MINE, Piute County, undergr, Au, Ag, Cu
Under devel

RAMBEC CORP
Milford
O K MINE, Beaver County, Cu

RAMSHORN MINES CO
333 Felt Bldg, Salt Lake City
Pres: W W Murray
Sec: Leo Eager
(See Idaho)

RARE METALS CORP OF AMERICA (Subsid of EL PASO NATURAL GAS CO)
1st Security Bldg, Salt Lake City
Pres: Paul Kayser (Box 1492, El Paso, Tex)
VP & Gen Mgr: C L Perkins (El Paso)
VP & Asst Gen Mgr: M H Kline
VP: R J Crowley
Sec-Treas: Virgil Rittmann
Asst Sec: H Anne Kidd
Supt, Production Dept: A A McKinney
Supt, Explor Dept: E J Carlson
Ch Chem: R Kronstadt
Purch Agt: Claude J Jenkins
(See Ariz, Calif, Idaho)

REALTY URANIUM & MNG CO, THE
937 Nat'l Bank Bldg, Denver 2, Colo
LUCKY STRIKE MINE, Box 101 Richfield, Shootering Creek, Henry Mts, Garfield County, undergr, surface, U_3O_8, V_2O_5
Gen Mgr: Wm Robertshow
Supt: Harold Ekhero
Prod: 20 tons
(See Colo)

RICHEY, LEE
Monticello
PEACH MINE (Leased to Carl Dismant, Monticello), U_3O_8

RICO ARGENTINE MNG CO
132 S Main, Salt Lake City
Pres & Gen Mgr: Sherman B Hinckley
VP: J C Johnson
Sec: L J Lerwill
Treas: B B Hall
(See Colo)

ROBERTS, PARRY & LEHMAN
Minersville
CREOLE MINE, Beaver County, Cu

ROBINSON, J S
Fillmore
ALMOND MINE, Millard County, Cu

ROCKY PASS MINE & DEVEL CO
c/o Joseph Nicholas, Tremonton
MINE, Box Elder County, WO_3

NORMAN ROGERS MNG CO
c/o Norman Rogers, Milford
CUPRIC MINES, Beaver County, Cu

SALT LAKE TUNGSTEN CO, THE
2160 Indiana Ave, Salt Lake City
Pres: Blair Burwell
VP: Marion E Pettigrew
Sec-Treas: John J Davis
Purch Agt: E W Isham
TUNGSTEN REFINERY "Synthetic Scheelite"
Supt: I W Wiggs
Assay & Chem: R L Jenson

SAMSON URANIUM, INC
901 Sherman St, Denver, Colo
Gen Mgr & Purch Agt: Robert T Martin
MINE, Moab, undergr, U_3O_8
Under devel
(See Colo)

SAN FRANCISCO CHEM CO
Dr F, Montpelier, Idaho
ARICKEREE MINE, NE of Randolph, undergr, phosphate rock
Gen Supt: Charles C Stephens
(See Idaho, Wyo)

SCRANTON ZINC-LEAD, INC
606 Rood Ave, Grand Junction, Colo
Pres: K Dean Butler
SCRANTON MINE, North Tintic dist, near Eureka, Zn, Pb
Under devel

SEVIER MINERALS CO
Box 191, Richfield
Pres: Wm R Robertshaw
MINE, in Ariz
(See Ariz)

SHASTA COPPER & URANIUM CO
612 Dooly Bldg, Salt Lake City
U_3O_8 Prod

SHEBA URANIUM MNG & EXPLOR, INC
513 Kiesel Bldg, Ogden
Pres & Gen Mgr: A E Witt
VP: D J Nelson

Sec: Joan Meanor
CLAIMS, Indian Creek, 40 mi SE of Moab, U_3O_8

SHUMWAY URANIUM MNG CORP
65 E Fourth S, Salt Lake City
CLAIMS, Lost Park Point, White Canyon area, San Juan County, U_3O_8
CLAIMS, Sevier County, U_3O_8

SILVER BUCKLE MNG CO
904 Walker Bank Bldg, Salt Lake City
Pres: Dr P E Scott
VP: Clark L Wilson
Sec: Alden Hall
Treas: Jack D Gay
URANIUM PROP, Big Indian dist, San Juan Co
Explor
(See Idaho)

SILVER LAKE MNG CO
565 E 2nd South, Provo
Pres: J J O'Brien
MILKMAID MINE, Utah County, Ag Pb, Zn

SILVER PICK URANIUM INC
1155 1st Security Bldg, Salt Lake City
BUCKS CLAIMS, near Blanding, San Juan County, U_3O_8

SILVER STANDARD MNG CO
30 Exchange Place, Salt Lake City
LAKES OF KILLARNEY MINE, Tooele County, Au

SILVER STAR MINES
510 Bank St, Wallace, Idaho
Pres: M D Anderson
Sec: V C Kingsbury
CLAIMS, W of Blanding, U_3O_8
Explor
(See Idaho)

SKIDMORE MNG CO
P O Box 558, Dolores, Colo
Pres: T N Skidmore
VP: G N Skidmore
Sec-Bkpr: N S Peck
MONTE CRISTO MINE, Moab, U_3O_8
Gen Supt: Chess Allmond
Asst Mine Supt: L M French
(See Colo)

SPANISH TRAIL URANIUM CO
26 W Broadway, No 4, Salt Lake City
Pres: F A Mathie
VP: Laurence W Cracroft
Sec: H A Zimmerman
Treas: F A Adams
WINDOW ROCK MINE, Muddy River, Emery County, undergr, U_3O_8
Supt: L E Sanderson
Geol: Keith J Droste

STANDARD URANIUM CORP
P O Box 595, Moab
Pres & Gen Mgr: Wm R McCormick
VP: Mitchell Melich
Sec: Aaron Holman
Treas: I Newton Brotzen
Purch Agt: James B King, Jr
BIG BUCK MINE, Big Indian dist, San Juan County, undergr, U_3O_8
Gen Supt: Robert R Durk
Mine Supt: Russell L Wood
Prod: 10, 000 tons per month

STAR DUST MINES, INC
No 4, 243 E South Temple
Salt Lake City
Pres & Gen Mgr: Fred Cook
VP: Blake Proberi
Sec: George Souter
STAR DUST MINE, Gold Hill, undergr, surface, WO_3
Idle

STRATEGIC MINERALS EXPL
P O Box 1848, Grand Junction, Colo
Managing Part: John I Schumacher
Metallurgy & Oil: Harold C Anderson
PROPERTY, Labal Creek & Red Canyon areas, U_3O_8
Explor

SUNBURST URANIUM CORP
1975 NW Everett St, Portland 9, Oreg
MINE, Cane Springs Canyon, San Juan County, undergr, U_3O_8
SAN JUAN CLAIMS, Lander County, undergr, U_3O_8
(See Nev, Oreg)

SUNNYSIDE URANIUM CO
Marysvale
Gen Mgr: Lane J Bertelsen
BUDDY MINE, 5 mi NE of Marysvale, undergr, U_3O_8
Under devel

SUNSHINE MNG CO
730 Peyton Bldg, Spokane 1, Wash
RANDOM MINE, Box 474, Blanding, Cotton Wash, San Juan County, undergr
Gen Mgr: E E Eddy
(See Idaho, Wash)

SUN STAR MLG CO
2145 Indiana Ave, Salt Lake City
MINE, Tooele County, WO_3

SUN URANIUM MNG CO
404 Boston Bldg, Salt Lake City
Pres: H G Metos
VP: Tom P Costas
Sec: R L Cranmer
Treas: B N Meldrum
MINE, undergr, WO_3, U_3O_8
Prod: 20 tons

SUSAN B URANIUM CORP
Virginia-Truck Bldg, Carson City, Nev
Pres: Joe Z Crawford
VP: Hy Kanter
Sec-Treas: Carl G Johnson
PROPERTIES, Undergr, surface, U_3O_8, WO_3
Gen Mgr: Lee Bowman
Asst Gen Mgr: Lee Killman
Geol: Christian Vraag
Under devel
(See Ariz, Colo, Wyo)

SYNDICATE OIL & MINERAL CO
184 E 5th North, Provo
Pres & Mgr: Ben H Bullock
EARL 5 MINE, Utah County, Ag, Pb, Zn

TEMPLE MOUNTAIN URANIUM CO
30 Exchange Place, Salt Lake City
Pres: Herman Heinecke
VP: Geo Heinecke
Sec-Treas: Augustus Reeves
CLAIMS, Green River, Torrey, undergr, surface, U_3O_8, Ag, Pb
Under devel
(See Idaho)

TEXAS URANIUM CORP
404 Boston Bldg, Salt Lake City
Pres: Tom Metos
VP: James Jellison
Sec-Treas: Sid Spencer
CLAIMS, Green River area, U_3O_8

TEXAS-ZINC MINERALS CORP
628 Rood Ave, Grand Junction, Colo
Mgr: A L Hayes
HAPPY JACK MINE, White Canyon via Blanding, undergr, U_3O_8
Gen Supt: R E Radabaugh
Mine Supt: E J Swapp
800-TON MILL, Mexican Hat, acid leach & Solvent extraction
Mill Supt: K C Apland

THOMPSON, WARREN BARRY
P O Box 1627, Denver, Colo
FROSS MINE, Washington County, undergr, Au, Ag, Hg, V_2O_5, U_3O_8
Gen Mgr and Lessee: W B Thompson
Under devel
(See N Mex)

THORNBURG MNG CO
140 W Main St, Grand Junction, Colo
Own & Gen Mgr: Vance Thornburg
Sec-Treas: J T Tunnell
7 MILE MINE, 12 1/2 mi NW of Moab, undergr, U_3O_8
Mine Supt: Edward G Johnson
Prod: 15 tons
(See Colo)

THUNDERBIRD URANIUM CO
40 N 3rd St W, Salt Lake City 10
Pres: Robert W Elliott
VP: C D Craddock
Sec: Robert W Miller
THUNDERBIRD MINE, undergr, U_3O_8
Bluff
Gen Mgr: Ross A Musselman
Geol: Mason Rankin
Mine Supt: C F Justice
Mine Engr: Mike Keeley
Under devel
(Merged into Continental Uranium, Inc, Chicago, Ill)

TIMCO URANIUM, INC
1353 Blaine Ave, Salt Lake City
Pres: C A Schettler
VP: L D Gardner
Sec-Treas: P L Maxwell
URANIUM PROPERTIES, White Canyon, undergr, U_3O_8
Idle

TINTIC LEAD CO
30 Exchange Place, Salt Lake City
Pres: P H Hunt
VP: D M Draper, Sr
Sec-Treas: D H Bullough
MINE, Milford, open pit, Cu
(Leased)

TINTIC STANDARD MNG CO
1114 Walker Bank Bldg, Salt Lake City
Pres: H E Raddatz
Treas & Gen Mgr: M D Paine
Sec: Glen Hardy
Eng-Geol: Fred W Hanson
TINTIC STANDARD IRON BLOSSOM MINES, Dividend, undergr, Au, Ag, Cu, Pb, CaF_2
COUGAR MINE, 25 mi NW of Lund, undergr, Pb, Ag, Cu, Au, CaF_2
Idle

TINTIC URANIUM CO
1114 Walker Bank Bldg, Salt Lake City 11
Pres: H E Raddatz
VP: L L Travis
Sec: Glen Hardy
Treas: M D Paine
MINE, Moab, U_3O_8
Geol: Fred W Hanson
Mine Supt: Ralph E Hawks
Prsn: Lynn Hawks
Under devel

TRANS-WESTERN URANIUM CORP
412 Ness Bldg, 28 W 3d S St
Salt Lake City
U_3O_8 Prod

TRIANGLE URANIUM CORP
2460 Kiesel Ave, Ogden
Pres: Geo T Sugihara
VP: A M Runnels
Sec: Carl Cowan
Treas: Wm Em Johnson
STRAWBERRY MINE NO 1, Weber County, undergr, surface, Cu
Gen Mgr: Geo T Sugihara
Supt: Donald G Oliver
Prsn: A M Runnels
Eng: Geo Ryan

TRIPPLE M MNG CO
Hobbs, N Mex
HORSE SHOE I O.C. MINE, Grand County, Cu

TWO STATES URANIUM CO
Bountiful
(See Peterson, M F & Lorena, in Herndal

U-NEVA URANIUM CORP
954 E 1st South, Salt Lake City
Pres: Walter E Cosgriff
VP: Sidney E Mulcock
Sec-Treas: Judge M K Snow
OURAY CLAIMS, Uintah County, U_3O_8
BEE, TEMPLAR, BIRDSEYE, & VERA CLAIMS, Emery County, U_3O_8

UNION CARBIDE NUCLEAR CO, A DIV OF UNION CARBIDE & CARBON CORP
P O Box 1100, Grand Junction Colo
U_3O_8 Prod
(See Calif)

UNION GULF OIL & MNG CORP
3701 U S Hwy 50, Grand Junction Colo
PETERS NO 1, PEW NO 1 MINES, Green River, Emery County, c/o Edward J Klaeger, Box 375, Green River, undergr, surface, U_3O_8, V_2O_5
Gen Mgr: Edward J Klaeger
(See Colo, N Mex)

UNITED IDAHO MNG CO
808 Newhouse Bldg, Salt Lake City
Pres & Gen Mgr: Roger V Pierce
(See Idaho)

UNITED MINERALS CORP
518 Felt Bldg, Salt Lake City
Pres & Gen Mgr: G W Snyder, Jr
VPs: G W Snyder, H A Covy
Sec: Guy Snyder
(See Ariz, Nev)

UNITED PARK CITY MINES CO
1007 Kearns Bldg, Salt Lake City
Pres: John M Wallace
VP: Frank A Wardlaw, Jr
Sec-Treas: J Wm Stoner
Purch Agt: T K Davis
MINES, Heber, Park City, Keetley undergr, Pb, Zn, Ag, Au
Gen Mgr: S K Droubay
Gen Supt: G W De LaMare
Geol: Arthur Gray & H V Stewart
Asst Gen Supt: Gordon McMillan
Prod: 265 tons

U S COMMONWEALTH URANIUM
508 Judge Bldg, Salt Lake City
URANIUM Prod

U S LITHIUM CORP
1205 Walker Bank Bldg, Salt Lake City
Pres & Gen Mgr: Paul T Walton
VP & Sec: N G Morgan, Jr
Purch Agt: Charles T Vasilos
(See Colo)

UNITED STATES GYPSUM CO
300 W Adams St, Chicago 6, Ill
MINE, Sigurd, open pit, gypsum
Works Mgr: R M Paschall
(See Calif, Colo, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Tex, Va)

UNITED STATES SMELTING, REFINING & MINING CO
WESTERN OPERATIONS
New House Bldg (Box 1936), Salt Lake City 10
VP & Gen Mgr, West Oper: O A Glaeser
Mgr, West Mines: A G Kirkland
Asst to Mgr, West Mines: Max M DuBois
Mgr, Midvale Plant: H L Johnson
VP & Ch Geol: R N Hunt
Indus Devel Dir: J M Ehrhorn
Ch Mech Eng, West Oper: Boris Ashurkoff
UTAH OPERATIONS
U S & LARK MINE, Bingham dist, Pb, Zn, Cu
Gen Supt: Boston Boyd
Supt, U S Section: John Holmes
Supt, Lark Section: Harold Wells
MIDVALE PLANT, FLOT MILL & LEAD SMELT
Gen Supt: C A Nelson
Mill Supt: A A Nelson
(See Alaska, Ariz, Mass)

U S STEEL CORP
COLUMBIA-GENEVA DIV
120 Montgomery St, San Francisco Calif
VP: L J Westhaver
Gen Supt: L P Black
BLAST FURNACE, Geneva, near Provo
(See Alaska, Ala, Calif, Minn, Pa, Tenn, Wyo)

UNITED WESTERN MINERALS CO
136 W Palace Ave, Santa Fe, N Mex
MINES, Grants area, Coleman Canyon & Circle Cliffs, undergr, surface
Eng: H N Rhodes
Under devel
(See N Mex)

URAINBOW, INC
900 Kearns Bldg, Salt Lake City
(See Ariz)

URANIUM CORP OF AMERICA
3955 S State, Salt Lake City
LULU NO 1 MINE, Montezuma Canyon, San Juan County, undergr, U_3O_8
Gen Mgr: H E Cole
Gen Supt: Roy W Andrews
CLAIMS, Kane Canyon, Montezuma Canyon
Under devel
(See Colo, N Mex)

URANIUM INDUSTRIES, INC
Box 422, Green River
VANADIUM KING NO 1, undergr U_3O_8
(See Colo)

URANIUM REDUCTION CO
557 1st Security Bldg, Salt Lake City 11
Pres: Mitchell Melich
VP: Charles A Steen
Sec-Treas: C M Christensen
Exec VP: R A Young
Cont: John W Lopse, Jr
MILL, Moab, Acid Leach, 50 TPD
Gen Mgr: R P Hollis
Plant Supt: L A Painter
Asst Plant Supt: R W Unger
Ch Chem: Buford Winn

UTAH MERCUR GOLD MNG CO
Lehi
Pres & Gen Mgr: Charles Mercer
Sec: Geneve Mercer
MINE, American Fork Canyon, undergr, open pit, Au, Ag, graphite
Under devel

UTAH ORE SAMPLING CO
Box 219, Murray
Pres: E G Jensen
VP & Gen Mgr: Arnold Horlin
Sec-Treas: R E Allen
CUSTOM SAMPLING MILL
Mill Supt: J T Johnson

UTCO URANIUM CORP
310 1st Natl Bank Bldg, Denver, Colo
MINE, Monticello, surface, U_3O_8
(See Ariz, Colo, N Mex)

UTEX EXPLOR CO
P O Box 487, Moab
Pres: Charles A Steen
VP: Wm R McCormick
Sec: Mitchell Melich
Treas: Maxine Steen Boyd
Exec Asst: Mary Hope Westbrook
Comptroller: A T Ludlow
Purch Agt: W H Lewis
MI VIDA MINE, undergr, U_3O_8
Gen Supt: Virgil Bilyeu
Geol: Max Pierson
Asst Supt: Ted Barrett
Mine Frm: Hall Thorne
Chemist: Lauren Ball

VANADIUM CORP OF AMERICA
Marysvale
Gen Mgr: D W Vilas, Durango, Colo
PROSPECTOR, FREEDOM & FARMER JOHN MINES, Marysvale, undergr, U_3O_8
Mine Supt: Maurice Castagne
(See Ariz, Colo, N Mex, N Y)

VANURA URANIUM, INC
Marshall Court, Moab
Pres: William T Swift
VP: Ellis R Cook Jr
Field Supervr: Everett Blackburn
(See Colo)

VESTALBE URANIUM & THORIUM CORP
Spanish Fork
Pres: Lee W Southam
VP: August H Lage
Sec-Treas: Dee Hunter
Mine in Nevada
(See Nev)

VIPONT SILVER MNG CO
Box 198, Oakley, Idaho
VIPONT MINE, Box Elder, Au

VITRO URANIUM CO
(A DIV OF VITRO CORP OF AMER)
600 W 3300 So St, Salt Lake City
Pres: J C Ward
Exec VP: G Wein
Sec: W H Dreese
Treas: R T Ruder
Gen Mgr: W B Holt
Purch Agt: C A Theobald
HYDROMETALLURGICAL PLANT, Salt Lake City
Pl Mgr: R C Cole
Mill Supt: M T Ellis
Pl Eng: R N Miller
Process Eng: J D Moore
Ore Buyer: R B Coleman
Assay: G W Hansen
(See Wyo)

WALKER ENGR CORP
612 Dooly Bldg, Salt Lake City, Utah
Pres: R T Walker
VP: W J Walker
Sec: Belle T Walker
(See Calif, Colo, Idaho)

WEST PARK MINING CO
Box 406, Provo
Pres: J H Peterson
VP: J Ruion Morgan
Sec-Treas & Purch Agt: Dean W Payne
WEST PARK MINE, 2 mi S of Brighton & 8 mi NW of Midway, undergr, Cu, Au, Ag
Gen Mgr: Arvil H Scott
Geol: E A Hewitt
Prod: 4 tons

WEST TOLEDO MINES CO
30 Exchange Place, Salt Lake City
Pres: Sid Spencer
Sec-Treas: David H Bullough
MINES, Alta, Little Cottonwood dist, undergr, Pb, Ag

WESTERN GOLD & URANIUM INC
Box 27, Leeds
Pres: Ralph G Brown
VP: David P Shirts
Sec: Barent Backus
Cons Met: Alan Kissock
Cons Eng: C E Prior
SILVER REEF MINE, Leeds, undergr, U_3O_8, Ag, V_2O_5, Cu
Gen Supt: Richard V Wyman
Mine Supt: Jack K Howell
Mine Frm: Carlyle Stirling
Prod: 50 tons
75-TON SILVER FLOT MILL, Silver Reef
Mill Supt: Jack K Howell
Assay: Art Eastman

WHELCHEL MINES CO
1919 Arthur St, Caldwell, Idaho
Pres: William E Whelchel
VP: Ralph A Whelchel
Sec-Treas: Theresa M Whelchel
MEGATON & PLUTONIC GROUP, U_3O_8, V_2O_5
Under devel

WHITE CANYON MNG CO
200 N 6th St, Grand Junction, Colo
Pres: A L Hayes
VP: T R Redman
Sec: Walter E Will
Treas: E E Schwegler
Purch Agt: John H Crawford
HIDEOUT & WHITE CANYON NO 1 MINES, San Juan County, undergr, U_3O_8
Mgr: A P Boyd
Geol: P H Lamberton, P V Carrillo
Surv: James R Franklin
Mine Supt: Robert V Hancock
Prod: 100 tons

WILBERT MNG CO
316 Kearns Bldg, Salt Lake City
Pres & Treas: R J Hogan
VP: M P O'Reilly
Sec: Claude Engberg
(See Idaho)

WOODMONT, INC
(Wholly owned subsid of CONTINENTAL URANIUM, INC)
520 S Ninth St, P O Box 1550
Grand Junction, Colo
RATTLESNAKE MINE, Moab, open pit, U_3O_8, V_2O_5
Mine Supt: John Roscoe
Prod: 200 tons

WORTLEY BROTHERS
50 E 1st North, Bountiful
GRASSELLI MINE, Summit County, Ag, Pb, Zn

WORTLEY, RAY & STEELE, GEORGE
Eureka
APEX STANDARD DUMP, Utah County, Au

WYCO URANIUM, INC
Kansas City, Mo
Pres: L M Meddinger
VP: Martin J Gejot
Sec: Clifford N Jarrett
CLAIMS, Blanding, U_3O_8
Field Mgr: J C Harvey
Explor

ZUMA URANIUM & OIL CO
600 Utah Savings & Trust Bldg, Salt Lake City
ZUMA MINE, Juab County, Ag, Pb, Zn

VERMONT

APPALACHIAN SULPHIDES INC
36 Toronto St, Toronto, Ontario, Canada
Pres: J Cunningham-Dunlop
VP: W H Shoob
Treas: H E Noeo
Sec: Philip Bantedo (New York City)
ELIZABETH MINE, South Strafford, undergr, Cu, Pyrrohotite, Ag
Asst Treas: C B Benson
Purch Agt: H I Davis
Gen Mgr: J P Cowley
Asst Gen Mgr: C B Benson
Geol: R C Dwelley
Met: J W Sheedy
Elec Eng: J T Maclay
Mine Supt: R H Little
Asst Mine Supt: C F Barker
Mine Frm: G G Austin
Prod: 300 tons
950-TON FLOT MILL, South Strafford
Mill Supt: J W Sheedy
Mill Frm: W O Stanley
(See N C)

EASTERN MAGNESIA TALC CO, INC
106 Bank St, Burlington
Pres: E W Magnus
VP & Gen Mgr: W W Magnus
Gen Supt: W A Beckels
Eng: L H Durbee
NO 2 MINE, 2 mi S of Waterbury, undergr, talc
Mine Supt: Maurice G Eastman
Mine Frm: Earl Clifton
Prod: 100 tons
100-TON DRY GRINDING MILL

NO 4 MINE, 5 1/2 mi N of Johnson, undergr, talc
Mine & Mill Supt: Roger W Perkins
Mine Frm: Cliff Allen
Prod: 150 tons
100-TON FLOT-DRY GRINDING MILL
Mill Frm: Alden Sargent

RUBEROID CO, THE
500 Fifth Ave, New York, N Y
VERMONT ASBESTOS MINE DIVISION, Hyde Park
MINE, Lowell, open pit, chrysotile, asbestos
Gen Mgr: I E Matthews
Asst Gen Mgr: W M Page
Geol: L Jordan
Mech Eng: E E Lanphere
Mine Supt: I M Potter
Asst Mine Supt: R O'Hear
Mine Eng: R K White
MILL, air separation
Mill Supt: C C White
Asst Mill Supt: R C Wescomb

VERMONT KAOLIN CORP
150 Cherry St, Burlington
c/o P F Jurgs and Company
MINE, Moulton, kaolin
Under devel

VERMONT MINERAL PRODUCTS, INC
Chester
Pres: Stanley F Durand
Sec: Walter H Austin
READING QUARRY, Reading, surface, micaceous talc
Mine Supt: Hollis H Corbin
GRAY MILL
Mill Frm: I S Wheeler

VERMONT TALC CO
Chester
Pres: T A Yager
Sec: Giles Biague
MINE, undergr, talc
Mine Supt: Frederick De Zaine
Mill, Chester

VIRGINIA

ALLIED CHEM & DYE CORP, GEN CHEM DIV
Box 389, Galax
GOSSAN MINES, 6 mi N of Galax, undergr, pyrrhotite
Supt: James O Nichols
Mine Frm: R F Dillon
Mine Eng: A H Yarberry
Met: S J Nameth
FLOT-GRAV MILL
Mill Frm: O W Manuel
(See Colo, Mo, N Y)

AMERICAN CYANAMID CO, PIGMENTS DIV
Piney River
MINE, open pit, ilmenite & apatite
FLOT-MILL, Piney River
Mine & Mill Supt: L L Campbell
PLANT
Plant Mgr: J S Carter
Asst Plant Mgr: J P Hopkins
Mech Eng: J M McConaghy
Elec Eng: J Wilson
(See Ark, Fla, Ga, NY)

FOOTE MINERAL CO
18 W Chelten Ave, Philadelphia 44 Pa
SUNBRIGHT DIVISION, Duffield
c/o W Edwin Dill, Jr
MINE, Sunbright, undergr, limestone
Gen Mgr: A McDonell
Asst Gen Mgr: W Hudspeth
Geol: T Kesler
Mine Supt: T Evans
Mine Frm: J Hughes
MILL, at mine
CHEMICAL PLANT, at mine
(See N H, N C, Pa, Tenn)

INTERNAT'L MINERALS & CHEMICAL CORP
Piney River
APLITE MINE
Supt: Claude Ellis
Prod: 100 tons
(See Ariz, Colo, Fla, Ill, Me, Miss, N Mex, N C, Ohio, S D, Tenn, Wyo)

NATIONAL GYPSUM CO
Kimballton
MINE & PLANT, undergr, Limestone
Plant Mgr: Monroe Rule
Prod: 1,500 tons
(See Ind, Iowa, Kans, Mich, N Y, Ohio, Pa, Texas)

NEW JERSEY ZINC CO
Austinville
BERTHA MINERAL DEV MINE, Zn, Pb
Mine Supt: K R Winslow
2,000-TON FLOT MILL
Supt: W L Albers
(See Calif, Colo, N J, N Mex, N Y, Pa, Tenn, Wis)

REYNOLDS MINING CORP
Reynolds Metal Bldg
Richmond
Pres: Walter L Rice
VPs: R H Zeglin, J Louis Reynolds
VP & Treas: C E Coghill
Sec: Allyn Dillard
Ch Geol: John D Mosee
Safety Eng: J E Nichols
Purch Agt: M W Henry
(See Ark, Colo)

TRI-STATE ZINC, INC
70 Pine St, New York, N Y
VP & Gen Supt: V C Allen
BOWERS-CAMPBELL MINE, Timberville, undergr, Zn
Gen Supt: Daniel Geary
Mine Supt: Carl Box
Prod: 720 tons
720-TON FLOT MILL, Timberville
Mill Supt: M C Bailey
(See Ill, N Y)

U S GYPSUM CO
Plasterco
Works Mgr: H D Decker
NUMBER SIX MINE, at Plasterco, undergr, gypsum
Mine Supt: E M des Rochers
Gen Frm: D R Davis
Prod: 1,000 tons
(See Calif, Colo, Conn, Ill, Ind, Iowa, Mass, Mich, Mont, Nev, N Mex, N Y, Ohio, Okla, Tex, Utah)

VIRGINIA-CAROLINA CHEM CO
401 E Main St, Richmond 8
Pres: William H Wilson
VP: C E Heinrichs
Sec: Richard E McConnell
Treas: I D Dawes
Purch Agt: Douglas W Laird
(See Fla, Tenn)

WASHINGTON

ADDY DEVELOPMENT CO
Addy
WASHINGTON METALS MINE, Stevens County, South of Gifford, WO_3
25-TON MILL, in SE 1/4
(Lessees George Monroe & Frank Birch)
Under devel

ALDER GOLD COPPER CO
Box 1140, Spokane
Pres: E Royce
Sec: R K Magney
Treas: Harvey F Stone
ALDER MINE, Twisp, undergr, Cu, Au, Zn
Under devel
300-TON FLOT MILL

ALEXANDER MINING CO
1230 E 69th, Seattle 15
c/o Alexander J Akishin
THREE "S" GULCH PROP, King County, Zn, Pb
Idle

AMERICAN SILVER MNG CO
123 W 4th Ave, Spokane
Pres: H C Snyder
VP: J M Henneck
Sec & Treas: L B Conrad
(See Idaho)

AMERICAN SMLTG & REF CO
Box 69, Colville
NORTHPORT UNIT, surface, Zn, Pb
Supt: P A Lewis
Frm: Frank Paparich
Asst: Fred Harding
Prod: 1,000 tons
1,000-TON FLOT MILL
Mill Supt: R K McCallum
Assayer: Wilson Tooke
TACOMA SMELTER, Box 1595, Tacoma, Copper smelter, Electrolytic refinery, arsenic refinery & acid plant
Gen Mgr: E R Marble
Asst Mgr: G E Sigler
Gen Supt: P T Benson
Purch Agt: J F Vuggi
(See Ariz, Calif, Colo, Idaho, Ill, Kans, Md, Mont, Neb, N J, N Mex, N Y, Tex, Utah, Wash & Federal Mng & Smelting Co, Mo)

AMERICAN ZINC, LEAD & SMELTING CO
927 Old Nat'l Bank Bldg, Spokane
Western Mgr: R E Calhoun

Purch Agt: R F Tharp
GRANDVIEW MINE, Metaline Falls, undergr, Zn, Pb
Res Mgr: John W Currie
Mine Supt: C L Sage
Geol: E A Frick
Mine Frm: C P Sage
Mine Eng: M L Pabert
Prod: 850 tons
850-TON FLOT MILL
Mill Supt: D A Underwood
(See Ariz, Ill, Mo, Ohio, Okla, Tenn, Tex, Wis)

AUSTIN-MEYER CORP
642 Peyton Bldg, Spokane 1
MINE, in Idaho
(See Idaho)

B & C MINING CO
Box 28, Colville
Co-Owners: E M Bailey & Lee Cagle
MINE, Stevens County, Kettle Falls dist, undergr, Zn, Pb, Ag
Under devel

BEAR CREEK MNG CO
W 1017 Riverside Ave, Spokane 1
Dist Geol: Lowell B Moon

BEHRENS, HAROLD E & LOGSDON, A M
Box 1182, Spokane
BEHRENS PLACER, in Idaho
(See Idaho)

BIG DOME MINING CO
401 12th Ave N, Seattle
Pres: Oscar Johnson
MINE, Kittitas County, Cu
Under devel

BIG IT MNG & MLG CO
7542 Jones Ave NW, Seattle 7
(See Idaho)

BIG SMOKE URANIUM, INC
725 Pauleen Bldg, Spokane 1
Pres: Wm O Kumbera
VP: Eugene A Kumbera
Sec & Treas: Martha Diehm
BIG SMOKE MINE, Spokane Indian Reservation, open pit, U_3O_8
Geol: Kenneth Russell
Under devel

BLUE BONNET
320 N Hillcrest, Yakima
Williams, Riley & Assoc
MINE, Kittitas County, Camp Creek area, Cu, Au, Ni
Under devel

BONANZA LEAD CO
Box 111, Colville
Owners: E B Gibbs, I M Husley
BONANZA MINE, Stevens County, Pb, Ag
Under devel

BUCKEKIN MINES, INC
4123 W Holden St, Seattle 6
Pres: O C Holtan
VP: J M Hensen
Sec & Treas: M M Bemis
Purch Agt: J M Jensen
(See Idaho)

BUNKER HILL CO, THE
The Bunker Hill Bldg, 000 Market St, San Francisco 4, Calif
Ch of Bd: Simaly A Easton
Pres: John D Bradley
VP: Emmett G Solomon, W G Woolf, D L Feathers, R H Cutting
Sec: D L Feathers
Treas: Emmett G Solomon
Purch Agt: Gil Mayes, Kellogg, Idaho
FABRICATION PLANT & SECONDARY LEAD SMELTER, 2700 16th Ave, SW, Seattle 4, Wash
Prod Mgr: Alvin Kroll
VP, Sales & Fabrication: Roger H Cutting
(See Idaho)

CAMBRIAN MNG CO
526-27 Hutton Bldg, Spokane
Pres: Otto L Bagdon
VP: Theodore Kary
Sec: Kenneth R Bagdon
Treas: Lloyd E Sherrill
PROSPECTS, Stevens & Pend Oreille Counties
Under devel

CARR BROTHERS
Rt 1, Valley
Owners: Carr, C R & J M
EDNA MINE, Stevens County, Valley dist, Ag, Cu, Au
Under devel

CHROME CLIFF MNG CO
1315 Dudley Ave, Prosser
Pres: Fred W Wagener, Jr
VP: C O Mitchell
Treas: Thomas West
CHROME CLIFF, QUEEN CAROL & KROME KING MINES, undergr & open pit, Cr
Gen Mgr: James Dow
Under devel

CLEAR WATER MINES, INC
401 Empire State Bldg, Spokane 1
Pres: H G Loop
VP: Geo A Purdy
Sec-Treas: E I Fisher
Purch Agt: Geo A Purdy

CLE ELUM RIVER MNG CO, INC
310 Blaine St, Seattle 9
Pres: Phil Denney
LUCKY STRIKE MINE, Kittitas County Camp Creek area, Ag, Au, Pb, Zn
Under devel

CONCULLY MINES
908 Henratty Dr, Yakima
Pres: H G Olson
PEACOCK MINE, Ruby dist, Okanogan County, Ag, Pb, Zn, Cu
Gen Mgr: I E Dubois
50-TON FLOT MILL, at Omak

CONJECTURE MINES, INC
326 Wiggett Bldg, Coeur d'Alene, Idaho
VP: H E Sanderson
Sec-Treas: Lyle B Funnell
Pres & Gen Mgr: Donald E Major, 241-427 W 3rd Ave Spokane, Wash
(See Idaho)

CONSOL MINES & SMELTING CO, LTD
Wilbur
Pres: Hugh Brown
Sec-Treas: D P Gellatly
THREE PROPERTIES at Keller, Ferry County, undergr & surface, Cu, Mo
Idle

CRESCENT MINE
181 Lombardy Lane, Orinda, Calif
c/o Dan C Peacock
MINE, Clallam County, Lake Crescent area, Mn
Under devel

CRYSTAL CITY MNG CO
17127 E Sprague St, Greenacres
Pres: Luke Williams
CRYSTAL MINE, Lincoln County, Miles area, Ag, Pb, Cu, WO_3
Under devel

D M E MNG CO
Wallace, Idaho
Pres: T D French
KELLY CAMP MINE, WO_3
(Leasing from Chas J Weller, Republic)

DAWN MINING CO
Ford
Pres: G S Hinsdale
MIDNITE MINE, Stevens County
1918 S Post St, Spokane, U_3O_8
Gen Mgr: R B Fulton
Under devel

DAWN URANIUM & OIL CO
422 Pauleen Bldg, Spokane
Sec-Treas: C R Echlin
SMITH, WILSEMORE LEASE, & CURTIN FARM MINE, Spokane County, U_3O_8
Under devel

DAY BREAK URANIUM, INC
12707 Valleyway, Opportunity
Pres: James W Fox
VP: Tom A Smith
Sec-Treas: Kae H Bowers
MINES (3), open pit, autunite, uranilite
Mine Supt & Geol: H W Norman
Met. J Fred Williams, Jr
Prod: 100 tons

DEER LAKE TUNGSTEN MINE
Box 384, Deer Park
Mgr: W H West
MINE, Blue Grouse Mt, undergr, surface, WO_3
Prod: 25 tons
25-TON GRAV MILL

DELMAR MNG & MLG CO
N 5018 Lincoln, Spokane 19
Pres: Norman E Mills
VP: Adolph Obert
Sec: Harry O Kloss
(See Idaho)

DEVIL'S CANYON MNG CO, INC
601 Central Bldg, Seattle 4
Pres & Gen Mgr: Vernon M Osterberg
VP: Edwin Saurers
Sec: W D Gotham
Treas: Dr G M Osterberg
DEVIL'S CANYON MINE, Burns Vista Mng dist, King County, undergr & open pit, Cu, Mo, WO_3, Ag, U_3O_8
Under devel

DICK, WAYNE
Gen Del, Westport
STAPLEMAN PLACER MINE, in Idaho
(See Idaho)

EAGLE PEAK COPPER MINING CO
Box 86, Ashford
Pres: R H Wheelock
VP: Eva Crisman
Sec-Treas & Purch Agt: R P Crisman
MINE, Lewis County, undergr, Cu, Au
Gen Mgr: R H Wheelock
Under devel

EVERETT LIME CO
c/o Gordon C Clauson
1928 Milford Way
Seattle 3
McGRAW-KITTINGER DEPOSIT, Orcas Island, San Juan County, limestone
(Leased from Elsie Westerman, Seattle)

EVERGREEN MINES, INC
5002 Ivanhoe Pl NE, Seattle
Pres: John Wiatrak
EVERGREEN MINES NO 1 & 2
WHATCOM COUNTY, Pb, Zn, Cu, Au, Ag
Under devel

FLAG MOUNTAIN MNG CO, INC
Rt 2, Cle Elum
Pres: Ed Miner
FLAG MTN MINE, Stevens County, Au
Under devel

GENERAL MINES CORP
401 Empire State Bldg, Spokane 1
Pres: H G Loop
VP: Chris Roholt
Sec-Treas: E I Fisher
Purch Agt: Harry Linder
GENERAL MINES, undergr
Gen Mgr: H G Loop
Mine Supt: H G Loop
Under devel

GERMANIA CONSOL MINES, INC
401 Empire State Bldg, Spokane 1
Pres & Gen Mgr: Henry J Frans
VP: H G Loop
Sec-Treas: E I Fisher
GERMANIA CONSOL MINE, Hunters, undergr, WO_3
40-TON GRAV-FLOT MILL, Hunters

GLADDING, McBEAN & CO
945 Elliott Ave W, Seattle 99
PLANTS: Renton, mica
(See Calif)

GLADSTONE MINE
Alladdin Rt, Colville
Lessee: A G Lotze
MINE, Stevens County, Pb

GLADSTONE MT MNG CO
202 Radio Central Bldg, Spokane
Pres: Wm H Swann
VP: Fred W Vilen
Sec-Treas: E E Nicholls
GLADSTONE MINE, at Leadpoint, Pb, Ag
Lessee: A G Lotze

GOAT CREEK MNG & DEVEL CO
Mazama
Pres: Alva R Sharp
Mgr: Robert G Stewart
SILVER KING, APRIL, GOLD MOUNTAIN, GOLD BOB, & SUNVIEW MINES, Mazama, undergr, Cu, baron, magnetite, WO_3, Sb, Ag, Au
Under devel

GOLD BOND MINING CO
300 Columbia Bldg, Spokane 4
Pres: Frank Lilly
MINE, Chelan County, Au, Ni
Under devel

GOLDBEL MNG CO
405 6th Ave, Apt 501
Tacoma 3
Own: Ben E Labbe
SEPMAN MINE, undergr, quicksilver
Mine Supt: Floyd Ray
Mine Eng: Matthew Maddox
MILL & SMELTER, Norton
Assay: Galen Prine

GOLDFIELD CONSOL MINES CO
Box 2520 or 206 N Virginia St, Reno, Nevada
Res Mgr: T Higginbotham
DEEP CREEK MINE, Stevens County, Zn, Pb
Mine Supt: Al Quine, Colville
350-TON FLOT MILL
(See Calif, Nev)

GOLDSTONE MNG CO
511 Securities Bldg, Seattle
Pres & Gen Mgr: D W Porter
VP: Lynn Gunning
(See Idaho)

GONNASON, W L
1139 Perkins Way, Seattle
MINE, Snohomish County, Silver Creek area, Cu, Au, Ag
Under devel

GRANDVIEW MINES
310-311 Radio Central Bldg
Spokane 4
Pres: Karl W Jasper
VP: Paul Hertzel
Sec: E K Barnes
HARTBAVER PROSPECTS, Northpoint dist
(Joint venture with American Zinc, Lead & Smelting)

GRANORE COMPANY
1640 Exchange Bldg, Seattle 4
Pres: Lawrence T Postle
Sec-Treas: Elizabeth R Barnes
LONE STAR MINE, Perry County, Cu, Au, Ag

GREEN COMPANY, THE
119 N Post St, Spokane 1
Own: H F Green, G B Seybeck, Leo G Metville
MINE, Pen Oreille County, lime area, limestone

H & R COMPANY
3121 Everett Ave, Everett
Pres: Tony W Villella
MINE, Cu, Au, Ag
(Subleasing from Western States Copper & Uranium Corp)

HIDDEN TREASURE MINES, INC
117 S First St, Yakima
Pres: C J Caldwell
Sec-Treas: Harvey Johnson
CHINOOK MINE, Yakima County, Cu Au, Ag
Under devel

HIGHNOON URANIUM MINES, INC
Box 426, Newport
Pres & Gen Mgr: C N McJunkin
VP: Harvey Washburn
Sec-Treas: Charles A Pulford
Geol: J Fred Williams, Jr
LOST CREEK STRIKE, Lost Creek, 40 mi N of Newport, autinite
Under devel

HOWARD, MARK
E 2707 16th, Spokane
SILVER CIRCLE MINE, Ag, Pb, Zn

HOWE SOUND CO, CHELAN DIVISION
Holden
Mgr: J S Roper
Purch Agt: L E Still
Geol: R A Pansch
Ch Acct: R Scott
HOLDEN MINE, undergr, 12 mi from Lucerne, Cu, Au, Zn
Mine Supt: J M Newman
Mine Frm: P A Robertson
Mine Eng: L R B Atwater, Jr
Prod: 1,500 tons
2,000-TON FLOT MILL, Holden
Mill Supt: M E Defoe
Assayer: J L LaFrent
(See N Y & Calera Mng Co, Idaho, Utah)

HYDER MINES, INC
Sec-Treas: James W Bootjo, 310 Stewart St, Seattle 4
RIVERSIDE MINE, Au, Ag, Cu, Pb, Zn
(See Alaska)

HYPOTHEEK MNG & MLG CO
510 Bank St, Wallace, Idaho
CLAIMS, U_3O_8
(See Idaho, Mont, Utah)

IDAHO CONSOL MINES, INC
4100 Arcade Bldg, Seattle
Pres & Purch Agt: Edmund G Wilson
VP & Treas: Fred J Wettrick
Sec: H D Merrick
(See Idaho)

IDAHO LAKEVIEW MINES CO
502 Columbia Bldg, Spokane
Pres & Gen Mgr: J L Drumheller
VP: Kenneth M Howser
Sec-Treas: L R Gordon
Purch Agt & Gen Supt: Earl A McBaskel
(See Idaho)

IDAMONT LEAD-ZINC MINES CO
S 2323 Lincoln St, Spokane
Pres: R H Russell

VP: B A Smith
Sec: W B Russell
(See Idaho)

INSPIRATION LEAD CO
W 909 Sprague Ave, Spokane 4
Pres: E H Carlson
VP: C C Anderson
(See Idaho, Utah)

IOWA MINE
Rt 1, Box 156, Monroe
c/o Robert T Curtiss
IOWA MINE, Snohomish County, Cu, Ag, Au
(Lessee of blet claim from Sultan Basin Mining Co)
Under devel

ISABELL CONST CO
Box 23b1, Reno, Nev
DAWN MINE, open pit
Contract mng for Newmont Mng Co
Supt: Jim Barkley
VAN STONE MINE, open pit
Contract mng for American Smelting & Refining Co
Supt: Jim Barkley
(See Calif, Nev, Utah)

ISLAND MINES, INC
c/o Vernon Pratt, Route, Ferndale
CYPRESS MINE, Skagit County, Cr

KASLO MINES CORP
401 Empire State Bldg, Spokane 1
Pres: H G Loop
VP: E D Thompson
Sec-Treas: E I Fisher
MINE, in Canada (Howser, B C)

KNOB HILL MINES, INC
200 Sansome St, San Francisco, Calif
Pres: H H Kuechler, Jr
Sec: D D Farley
Treas: L E Heller
KNOB HILL MINE, Republic
undergr, Au, Ag
Supt: J E Davis
Frm: H W Marsh
Eng: T L Pittman
400-TON FLOT MILL, Cyanidation of tailings
Supt: Louis Lembech

KROMONA MINES CORP
621 Lloyd Bldg, Seattle 1
Pres: J F Krom
VP: J F Brand & H L Patchett
Sec-Treas: Ott L Reaser
KROMONA MINE, Sultan River Basin, Snohomish County, Cu, Au, Ag, WO_3, Mo
Met: W H Marquette
Under devel
100-TON FLOT MILL, at mine
Mill Supt: W H Marquette

L & N MINING CO
1129-16th Ave N, Seattle 2
Pres & Gen Mgr: W J Logue
VP: V R Newbury
Sec-Treas: M A Logue
Geol: Forbes Robertson
(See Nev)

LITTLE KING TUNGSTEN MINE
Box 364, Deer Park
LITTLE KING TUNGSTEN MINE, Blue Grouse Mt, WO_3
Mgr: W H Best
Prod: 12-15 tons
25-TON GRAV MILL, at mine

LONE STAR MINE
(ATTWOOD COPPER MINES, LTD)
(604) 730 W Pender St
Vancouver, B C
Pres: Dr Desmond F Kidd
LONE STAR MINE, Perry County, Cu
Idle

LOVITT MNG CO, INC
Box 1648, Wenatchee
Pres: E H Lovitt
VP: Vere McDowall
GOLD KING MINE, 3 mi S of Wenatchee, undergr & surface, Au Ag, silica
Mine Eng: Oscar Thompson
Prod: 200 tons

McPHAIL ENGINEERING CO
3128 112th, Tacoma
Charles W McPhail
PICKWICK PROP, Chelan County, Cu, Au, Ag
Under devel
(Leasing from Phantom Creek Copper Inc)

MILLER LIME CO
P O Box 308, Gold Bar
c/o Leslie B Miller
MINE, Gold Bar area, Snohomish County, limestone

MINERAL PROCESSORS, INC
Star Rt, Granite Falls
Own: Fred Bayh
MINE, Granite Falls area, Snohomish County, limestone
PLANT, Conway

MINES MANAGEMENT, INC
909 W Sprague Ave, Spokane
Pres & Gen Mgr: W R Green
VP: E E Johnston
Sec: L Howe
ADVANCE MINE, 6 mi S of Northport, undergr, Zn, Pb
Under devel
IROQUOIS MINE, 3 mi NE of Leadpoint, undergr, Zn, Pb
Idle
50-TON FLOT MILL
Northpoint

MITCHELL BAY LIME CO
c/o Gordon C Clauson
1920 Milford Way, Seattle 2
MAPLE FALLS QUARRY, near Maple Falls, Whatcom County, limestone

MITCHELL MNG CO INC
P O Box 301, Mt Vernon
Pres: K E Kravik
VP: Jess Pickering
Sec: Walter Hartwich
Treas: A C Pelland
MARGARET ANN MINE, P O Box 162, Butte, undergr, Ag, Au, Pb, Zn, Mn
125-TON FLOT MILL, Walkerville
Assay: Hammond Everly

MOUNT RANIER MNG CO, INC
Pres: Ole Oakland
MT RUTH & TEN VEIN GROUPS, Pierce County, Cu, Mo
(Under lease to E J McDonald & Asso, 2310 1/2 Yale N, Seattle)
Under devel

NEIMAN, A C
Aladdin Star Rt, Colville
ADMIRAL MINE, Northpoint dist, Stevens County, Ag, Pb, Zn

NEW HILARITY MNG CO
Box 27, Spokane
(See Idaho)

NEW RAINBOW MNG CO
647 Peyton Bldg, Spokane 1
WEBER MINE, in Idaho
(See Idaho)

NEW WELLINGTON MINES, LTD

NEW WELLINGTON MINES, LTD
641 Montreal St, Victoria, B C, Canada
BEAR CREEK MINE, Clallam County, Mn

NEW YORK - ALASKA GOLD DREDGING CORP
1616 Smith Tower, Seattle, Wash
Pres & Man Dir: J K Crowdy
VP: G G C King
Sec: Leise G Robbins
Treas: Fannie Barley
Purch Agt: L E Robbins
(See Alaska)

NINE MILE MNG CO, INC
P O Box 455, Republic
Pres: Alf Bradeen
VP: Everett W Stark
Treas: Leslie A Francis
NINE MILE MINE, undergr, WO_3, Au, Ag, Cu
Under Devel
Mine Supt: A F Bradeen
Asst Mine Supt: Leslie A Francis
Mine Eng: Norman D Lindsley
50-TON GRAV MILL, 3 mi below mine
Mill Supt: James I Smith

NORTH STAR URANIUM, INC
c/o Sam W Farber
W 1317 15th St, Spokane
LEHMBECKER LEASE, Spokane County, U_3O_8

NORTHERN TIN CO
911 American Building
Seattle 4, Wash
Pres: Harold Rowland
VP: Andrew O Olson
Sec: George Ramstad
Treas: A W Ramstad
(See Alaska)

NORTHWEST MAGNESITE CO
Chewelah
Pres: E A Garber
VP: C A Sargent
Sec-Treas: J C Stivers
Gen Mgrs: H A Ziebell
Plant Supt: Verdie Gentis
Plant Eng: Barney Endrice
Purch Agt: L A Knight
RED MARBLE MINE, 20 mi SE of Chewelah, surface, magnesite
Mine Supt: Roger L Fisk
Mine Frm: Lloyd King, John Estes
Mine Eng: J Brammer
Prod: 2,000 tons
3,000-TON FLOT MILL & HEAVY MEDIA
Mill Supt: T W Morton

NORTHWEST MINERALS INC
730 Peyton Bldg, Spokane 1
Pres: Forrest M Garrett
VP: H E Besly
Sec-Treas: Don A Gillis
Purch Agt: H E Besly
400 ACRE SNEVA LEASE, Milan, undergr, U_3O_8
Geol: H Graham Lynch, Sam Richardson
(See Idaho)

NORTHWEST REFIN & CHEM CO
N 125 Park Rd, Spokane 62
Pres: Barnard Wilco
VP: Tollif R Hance
Sec: Lonie Amato
Treas: Clark Upton, III
CUSTOM SMELTER, Dishman
Smelter Supt: B Wilco
Prod: 6,000,000 lbs Zn oxide yrly

NORTHWEST URANIUM MINES, INC
Box 1088, Wallace, Idaho
Pres: W E Scott
VP & Gen Mgr: Clark L Wilson
Sec: Alden Hull
Treas: Jack D Gay
NORTHWEST URANIUM MINES, E 10014 6th Ave, Spokane, open pit, U_3O_8
Gen Supt: Geo L Cloward
Prod: 400 tons
400-TON MILL, Wellpinit, acid leach
Under constr
PETER'S LEASE, Spokane Indian Reservation, open pit, U_3O_8
Under devel

NORTHWESTERN MNG CO
P O Box 3191, Seattle 24
(See California)

PACIFIC MUTUAL SILVER LEAD CO
W 1022 1st, Spokane
Pres: C A Lyon
VP: M C Yeager
Sec-Treas & Gen Mgr: C A Gray
ADDISON MINE, 11 mi SE of Keller, Ag, Pb, Zn, WO_3, Cu
Eng: H O Goodsell
Idle

PACIFIC NORTHWEST ALLOYS
Box 6247, Hillyard Station
Spokane 26
Pres: H A Timmins, Jr
VP & Gen Mgr: H B Megill
Asst Gen Mgr: R N Speet
Mech & Elec Eng: W Swann
Sec: R E Lowe
Treas: H O Brown
Purch Agt: C J Stark
Safety Eng: W E Hedger

PACIFIC NORTHWEST MNG CO
Rt 5, Box 449, Bremerton
Pres: W R Steyer
VP: Robt A Rukke
Gen Mgr: Norman D Lundsley
Geol: J W McIrose
LUCILLE MINE, 2 mi N of Leadpoint, undergr, Zn, Pb, Ag
Under devel

PACHOR MINES, INC
310-313 Radio Central Bldg
Spokane 4
Pres: Graham Lammers
VP: Cline Tedrow
Sec: Karl W Jasper

PEND OREILLE MINES & METALS CO
923 Old Nat'l Bank Bldg
Spokane 1
Pres: Jens Jensen
VP: A W Witherspoon
VP: John D Bradley
Sec & Treas: A C Wimberly
Consultant: W L Zeigler
Purch Agt: R G Walker
Mgr: L M Kinney
Supt: L G Billings
PEND OREILLE MINES, 3 mi N of Metaline Falls, undergr, Zn, Pb
Frm: Craig Cody
Mine Eng: Elmer A Kassens
Prod: 2,000 tons
2,400-TON FLOT MILL, Metaline Falls
Mill Supt: J C Crampton
Assayer: R W Townsend

RAINIER MINING CO
Morton
Jerry Mills
SPENCER MINE, Lewis County, Morton dist, Hg
Under devel

ROCHE HARBOR LIME & CEMENT CO
Roche Harbor
Pres: Mrs Adda McMillin
Supt: J C Hassel
ROCHE HARBOR QUARRY, Roche Harbor, San Juan County, limestone

SILVER DOLLAR MNG CO
909 W Sprague Ave, P O Box 122
Spokane 19
Pres: Elmer E Johnston
VP: Leigh E Nicholls
Sec: Laurence Howe
Treas: W T Anderson
Purch Agt: W J Carlson
(See Idaho)

SILVER MTN MNG CO, INC
2403 S Tacoma Way, Tacoma
Pres: Arthur G Nickelsen
VP: Pran Gregorn
Sec-Treas: A Shilles
Purch Agt: A G Nickelsen
SILVER STAR, Tonasket, undergr, Ag, Au, Zn, Pb
Gen Mgr: Edward Rowan
Mine Supt: Carl Allemendra
Prod: 50 tons
Under devel
200-TON FLOT MILL, Tonasket

SPOKANE-IDAHO MNG CO
611 Peyton Bldg, Spokane 1
Pres: Frank N Marr
Sec: C D Randall
Treas: Charles E Marr, Jr
(See Idaho)

SPOKANE MNG SYNDICATE INC
730 Peyton Bldg, Spokane
Pres & Treas: H T Born
Sec & Purch Agt: Don A Gillis

SULTAN BASIN MNG CO
Rt 1, Box 156, Monroe
Pres: Kenneth Startup
VP: Robert T Curtiss
Sec-Treas: George Healt
IOWA MINE, Snohomish County, undergr, Cu, Au, Ag
(Leased to Robert T Curtiss)

SUNGOLD MINES, INC
711 Hutton Bldg, Spokane
Pres: Wm T Putnam
VP: L E Pringle
Sec-Treas: Jack T Larsen
(See Idaho)

SUNNY PEAK MNG CO
401 Empire State Bldg, Spokane 1
Pres: Charles J Weller
VP: D P Lanphere
Sec-Treas: E I Fisher
MINERAL HILL, MOHAWK & GURSER MINES, Concomully, undergr, Ag, Cu, Pb, Au
Gen Mgr: John H Cress
Asst Gen Mgr: Dale Lanphere
Under devel

SUNSHINE MNG CO
730 Peyton Bldg, Spokane 1
Pres: Robert M Hardy, Jr
VP: C M Hull
Sec-Treas: Frank M Hardy
Asst Sec: Stanton B Bennett
Asst Treas: Vincent P Whelan
Mgr, Mng Div: John Edgar
Mgr, Petroleum Div: A F Wynn
(See Idaho, Utah)

TREASUREMONT MNG CO
1129 16th Ave N, Seattle
Pres & Gen Mgr: W J Logue
Sec & Treas: M A Logue
(See Idaho)

TUNGSTEN URANIUM MINES, INC
711 Hutton Bldg, Spokane 4
Pres: Fred Utke
VP: Leonard Musser
Sec-Treas: Wellman Clark
GERMANIA MINE, Wellpinit, open pit, WO_3
250-TON GRAV MILL, at mine

TWIN SISTERS MAGNESIUM & CHROME CORP
1101 Terminal Sales Bldg, Seattle
Pres: Alwyn H Wild
Exec VP: A L Atherton
Sec: Marian Wild
Mng & Research Dir: George H Beers
MINE, Skagit County, open pit, Cr
Under devel
200-TON GRAV MILL, Hamilton
(Planning underway)

UNITED COPPER & AMAZON MINES
c/o E B Gibbs, Box 111, Colville
CHEWELAH COPPER MINE,
4 1/2 mi NE of Chewelah, undergr,
Ag, Cu, Au
Prod: 200 tons
200-TON FLOT MILL

WAR EAGLE MNG CO, INC
312 S 9th St, Yakima
Pres: E Walter Peterson
VP: Virgil L Packer
Sec-Treas: Leslie E Vanaken
Purch Agt: E W Peterson
11 CLAIMS, Copper Creek Mng dist, Yakima County, U_3O_8
(See Idaho)

WESTERN GOLD MINING, INC
712 Joseph Vance Bldg, Seattle
Pres: Harry Kramer
NEW LIGHT MINE, Whatcom County, Au, Ag
100-TON FLOT MILL

WESTERN STATES COPPER & URANIUM CORP
5905 Phinney Ave, Seattle 3
Pres: Charles Sisenvine
VP: Florin Cook
Sec-Treas: Errol Rhoades
RAINEY MINE, King County, undergr, Cu, Au, Ag
50-TON FLOT MILL
Assay: Willis Ott
(Property leased from M P Gilbreath, Seattle)

WESTERN URANIUM MINES, INC
730 Peyton Bldg, Spokane 1
Pres: William Winkler
VP: William Tanke
Sec: Don A Gillis
Treas & Gen Mgr: E J Minnaugh
Geol: Sam H Richardson
SHERWOOD LEASES, Wellpinit, Spokane Indian Reservation, open pit, U_3O_8
Under devel

WEST VIRGINIA

MEADOWBROOK CORP
Spelter
Pres: H D Carus
VP: H A Groesmeyer, A C Carus
Sec-Treas: C R MacBrayne
Purch Agt: T S Stuart
RETORT SMELTER, Spelter
Supt: H A Groesmeyer
Asst Supt: T R Ferguson
Prod: 40, 000 tons slab Zn yrly

WISCONSIN

AMERICAN ZINC, LEAD & SMELTING CO
1515 Paul Brown Bldg, St Louis 1, Mo
VINEGAR HILL DIVISION, Platteville
Gen Mgr: C A Dobbel
Gen Supt: J P Lacke
Geol: D W Hughes
MINE, Shullsburg, undergr, Zn Pb
Asst Mine Supt: Edwin E Pasco
Mine Frm: L E O'Driscoll, E M Kreul
Prod: 12, 000 tons monthly
800-TON FLOT MILL, Shullsburg
Asst Mill Supt: Wm C Trewartha
Mill Frm: Myron Hendricks
Assay: Geo H Kettler
(See Ariz, Ill, Mo, Ohio, Okla, Tenn, Tex, Wash)

BEERS, ROLAND F, INC
Platteville
Pres: Dr Roland F Beers
Gen Mgr: George Sullivan
EXPLOR, Zn, Pb

COMMERCIAL MNG, INC
Box 303, Marshfield
Pres: Grant Johnson
VP: Fred Wolff
Sec: W W Mittelstadt
Treas: Dan Hosek
(See Colo)

CUBA MNG CO
Platteville
Treas: A W Heins
Mgr: J P Lacke
PROPS, nr Mineral Point & New Diggings
Idle

EAGLE PICHER CO, THE MNG & SMELTING DIV
Galena, Ill
Gen Mgr: R L Haffner
Gen Supt: H H Hannan
Geol: H Calloway
Met: Albert Thayler
Maint Supt: Tom Ray
Maint Frm: Clarence Lyden
Mine Supt: E L Houy
Mill Supt: C C Crow
SHULLSBURG MINE & MILL, Shullsburg, Au, Pb
Prod: 1, 200 tons
BURKETT MINE, Hazel Green, Zn
Prod: 500 tons
LINDEN MINE, Linden, Zn
Prod: 300 tons
LINDEN MILL, Linden
Prod: 500 tons
(See Ariz, Ill, Kans, Nev, Ohio, Okla)

LA SHUBERCO MNG CO
Box 303, Marshfield
Pres: Grant Johnson
VP: W W Mittelstadt
Sec: Fred Wolf
Treas: Dan Hosek
(See Utah)

MEEKER'S GROVE MNG CO
306 Broadway St, Platteville
LIBERTY & LEO V MINES, 5 mi NE of Cuba City, undergr, Zn
Idle

MIFFLIN MNG CO
Box 132, Mifflin
Owner: Herb Turner
COKER, HICKFORD MINES, undergr, Zn, Pb
Gen Mgr: John F Howland
200-TON GRAV-FLOT MILL
Mill Supt: G H Pett

MONTREAL MNG CO
Montreal
Gen Supt: C A Bjork
Supt: D S Young
Asst Supt: C F Guenther
Master Mech: P J Petersen
Elec Eng: James Thomas
Mech Eng: Leo Arducant
MONTREAL MINE, 4 mi W of Hurley, undergr, Fe
Prod: 3, 950 tons daily
(See Oglebay-Norton & Co, Ohio)

MURRAY & RICHARDS MNG CO
Shullsburg
JAMES MINE, undergr, Zn, Pb
Gen Mgr: J H Richards
Prod: 250 tons
300-TON FLOT-GRAV MILL, at mine

NEW JERSEY ZINC CO, THE
Box 217, Platteville
EXPLORATION STAFF
Res Geol: J M Hague
Geol: Wayne Zwicky
(See Calif, Colo, N J, N Mex, N Y, Pa, Tenn, Va)

NEW TEASDALE MINE
Rt 2, Cuba City
Mgr: George Rooney
MINE, near Benton, undergr, Zn
Under devel

PICKANDS MATHER & CO ODANAH IRON CO
CARY MINE, Hurley, undergr
Supt: J C Wangaard
(See Mich, Minn)

PIQUETTE MNG & MLG CO
Box 4, Platteville
Gen Mgr: F B Piquette
PIQUETTE NO 1 & NO 2 MINES, 15 mi W of Platteville, undergr, Zn, Pb
Frm: Bernard Murray
Prod: 300 tons
GRAV-FLOT MILL
Frm: John Knebel

SCHROEDER MLG CO
Benton
TAILINGS, various mines, Pb, Zn
HOSKINS MILL, Shullsburg
350-TON MILL
Idle

ZONTELLI BROS, INC
DAVIDSON MINE, Florance, surface, Fe
Mine Supt: Don Olin
(See Mines)

WYOMING

ALJOB MNG CO
Thermopolis
HOLDINGS, Gas Hills area, Fremont County, U_3O_8

AMERICAN COLLOID CO
Merchandise Mart Plaza, Chicago 54, Ill
Pres: Paul Beckmer
VP: William D Weaver
Asst Sec-Treas: Jeanette Salman
Purch Agt: Arthur G Clem
UPTON MINE, Upton, open pit, bentonite clay
Gen Mgr: Orville Hora
Asst Gen Mgr: Donald Horn
Prod: 250 tons
250-TON MILL, Upton, drying and grinding
(See Ill, Miss, S D)

ANSCHUTZ DRILLING CO, INC
1411 Mile High Center, Denver, Colo
FLY GROUP, Converse County, undergr, open pit, U_3O_8
(See Colo)

ANTELOPE MINES
Box 341, Riverton
Mgr: N P Junkman
MINES, Riverton
Geol: L A Henderson
Under devel

BENTON CLAY CO
P O Box 432, Casper
Pres: Fred Carr
VP & Gen Mgr: I Kreiner
Sec-Treas: Henry Burgess
BENTONITE MINE, Natrona County, placer
Gen Supt: R E Goering
Geol: Fred Carr
Mech Eng: R E Goering
MILL, Casper

BLACK HILLS BENTONITE CO
Moorcroft
Pres: H T Thorson
Gen Mgr: A C Harding
MINE, Moorcroft & Upton surface, bentonite
Mine Supt: W A Robideon
Prod: 200 tons
180-TON MILL, drying & grinding
Plant Supt: Boyd Ash

CENTRAL OIL & URANIUM INC
Box 8, Douglas
Pres: R L Peterson
VP: Bruce Anderson
Sec: J W Anerson
URANIUM EXPLOR

CHEYENNE MNG & URANIUM CO
1502 Hot Springs Ave, Cheyenne
Pres: Wiley King (Hancock, Iowa)
VP: Arnold J Odern
Sec-Treas: Morris Andreason
COCHON, OSIRIS, & PAT MINES, Box 387, Riverton, open pit, U_3O_8

COLORADO FUEL & IRON CORP
Sunrise
SUNRISE MINE, undergr, Fe
Supt: M L Sisson
Asst Supt: R L Wahl, Jr
Eng: H B Lynch
Ch Elec: R E Davis
Ch Chem: H A Robb
Mine Frm: A E Testolin
Prod: 3, 100 tons
(See Colo, Utah)

COPPER KING MNG CO
Box 621, Cheyenne
Pres: Harry E Ferguson
VP: Andy E Roedel
Sec: P W Dinneen
Treas: Harry E Ruckman
COPPER KING MINE, 22 mi W of Cheyenne, open pit, Cu, Au, Ag, Ti
Mine Eng: T L Johnston, (Laramie)
Under devel

CROOK'S GAP MNG CO
P O Box 580, Kemmerer
Pres & Gen Mgr: Norman M Harrower
VP: Lee S Nebeker
Sec & Asst Gen Mgr: Robert M Harrower
SUN MINE, Home on the Range, Landen, Crook's Gap area, Fremont County, U_3O_8

CROWN URANIUM CO
208 Star Bldg, Casper
Pres: John G Obrecht
VP: Nathan Newick
Sec-Treas: Earl Johnson
CLAIMS, U_3O_8
(See Colo, Utah)

CRUSADER OIL & URANIUM CO
1717 E Colfax Ave, Denver 18
Colo
CLAIMS, U_3O_8
(See Colo, Utah)

CRYSTAL CREEK GYPSUM CO
243 W Main St, Lovell
Pres: Alfred Deschenes
VP: Herbert Daniels
Sec-Treas: Andy Gifford
CRYSTAL CREEK GYPSUM MINE, Crystal Creek and Hines, open pit, Gypsum
Gen Mgr: Thariel Sessions
Under devel

GADDIS MNG CO
1500 Mile High Center, Draper 2
Colo
Pres & Treas: W H Gaddis
VP: L E Smith, K E Baker
Sec: Laura Lacy
PROPERTIES, Crooks Gap area
Explor

GLOBE MNG CO
Box 1188, Casper
Pres: H D Hand
VP: Page T Jenkins
Sec-Treas: H Wayne Ashcraft
Purch Agt: E L Lockhart
GLOBE MINE, Riverton, open pit, U_3O_8
Supt: E L Lockhard
Geol: Richard Hagan
Asst Supt: Charles Perkins
Prod: 60 tons

GREEN RIVER OIL & URANIUM CO
36 W Broadway, Salt Lake City
Utah
MINE, Gas Hills, Fremont County, U_3O_8
Idle
(See Colo, Utah)

HOMESTAKE MINING CO
100 Bush St, San Francisco 4
California
PROPERTIES, U_3O_8
Under devel
(See Calif, S D, Utah)

HUGHES MNG CO
520 E Main, Riverton
Owner: Vern Hughes
PAT-N-BILL MINE, Gas Hills, 2 1/2 mi E of Lucky Mc, open pit, U_3O_8, V_2O_5
Explor
(See Veca Minerals Co & Two State Uranium Co, Wyo)

IDEX URANIUM INC
2215 Duff Ave, Cheyenne
Pres: Theodore L Brooks
VP: Jack R Cagle
Sec-Treas: Stewart C Lee
(See Colo)

INTERMOUNTAIN CHEMICAL CO, CHLOR - ALKALI DIVISION (Subsid of FOOD MACHIN & CHEM CORP)
Box 872, Green River
Div Mgr: Frank Farley
Purch Agt: R T Guest
WESTVACO MINE, undergr, trona
Gen Mgr: N E McDougal
Staff Asst to Mgr: R F Love
Gen Supt: J R Jacobucci
Mech Eng: H F Young
Elec Eng: L Ruffini
Process Supt. W C Dewey
Mine Supt: T S Bernatis
Staff Asst to Mine Supt: G R Rudnansky
Mine Frm: W F Peters
Mine Eng: W Z Wennoborg
200-TON MILL, at mine
solution & recrystallization
Mill Supt: A P McCue
Staff Asst to Mill Supt: J H Allesbeck
Mill Frm: R Kvidahl
(See Barium Prod, Ltd, Calif, Rev & Food Machin & Chem Corp, Calif)

INTERNAT'L MINERALS & CHEM CORP, EASTERN CLAY PRODUCTS DIV
Box 491, Belle Fourche
S Dakota
MINE, Crook County, surface, bentonite
Mgr & Purch Agt: K L Arthur
MILL, Belle Fourche, S Dakota
(See Ariz, Colo, Fla, Ill, Me, Miss, N Mex, N C, Ohio, S Dak, Tenn, Va)

IVORY, O R
622 Shorecliff Drive
Salt Lake City, Utah
URANIUM Prod

KELL-ROY MNG CO
Box 162, Linch
Pres: Roy Youkin
VP & Treas: William J Kelley
Sec: Twila Kelley
KELL-ROY MINE, undergr, open pit, U_3O_8
Under devel

KERR McGEE OIL INDUSTRIES, INC
Kerr McGee Bldg, Oklahoma City Oklahoma
URANIUM Prod
(See Ariz, Colo, Okla)

L & L URANIUM CO
933 1st Nat'l Bank Bldg
Denver 2, Colo
HOLDINGS, various parts of Wyo,
Uranium prod
(See Colo)

LITTLE MO MNG INC
Upton
Pres & Gen Mgr: Allan D Douglas
VP: John Kammerfeld
Sec: Earl Cox
Treas: J E Ackerman
MINE, Shoshoni, 25 mi NE of Shoshoni, open pit, U_3O_8, V_2O_5
Geol-Eng: Earl Cox
Supt: Millard Dickey

LOMA URANIUM CORP
316 Paramount Bldg, Denver 2, Colo
Pres: Carl L Lough
VP & Gen Mgr: J E Spaulding
Sec-Treas: John R Moran
Purch Agt: D T Hayes
HARDY NO 1 & HARDY-ZEE NO 4 MINES, 45 mi N of Douglas, open pit, U_3O_8, V_2O_5
Asst Gen Mgr & Ch Geol: J P McDaniel
Gen Supt: Jack Dressel
Geol: C J Templain
Mine Supt: A K Eggers
Prod: 100 tons
(See Colo)

LOST CREEK OIL & URANIUM CO
(now WESTERN METALS INC)

LUCKY Mc URANIUM CORP
907 Walker Bank Bldg, Salt Lake City, Utah
Pres: W H H Crafmer
VP: Neil McNeice
Sec: Robert Cranmer
Treas: Robert Moran
LUCKY McMINE, Masonic Temple Bldg, Riverton, 50 mi E of Riverton, Gas Hills Mng dist, open pit, U_3O_8
Gen Mgr: A V Quine
Geol: Don C Anderson
Mech Eng: Lowe H Morfold
Met: Robert Porter
Under devel
750-TON MILL, Gas Hills field column exchange
Under constr

M. I. L. URANIUM, INC
1006 Parlow Ave, Rapid City, S D
GOLDEN EAGLE (1 - 3 thru 55), Riverton, U_3O_8
Gen Mgr: Emmet Isaacs (Rapid City, SD)
Under devel
(See S D)

MAGNET COVE BARIUM CORP
Box 832, Greybull
Mgr: Lee Gramior
MINE, 8 mi E of Greybull, surface, bentonite
250-TON MILL, drying & grinding
Mill Supt: John M Copenhaver

McALESTER FUEL CO
P O Box 783, 200 E Wyandotte, McAlester, Oklahoma
Pres: J G Peterbaugh
VP & Gen Mgr: Tom E Garrard (901 W Park St, Riverton, Wyo)
Sec-Treas: Carl Oman
Geol & Mine Eng: Robert Ford (P O Box 428, Riverton)
MINE, open pit, U_3O_8, Cu
Under devel

MEDICINE BOW URANIUM CO, INC
3134 S 20th East, Salt Lake City 6, Utah
Pres & Gen Mgr: J E Ferre
VP: James E Potter
Sec-Treas: Lionel J Bradford
SKIPPY NO 23 MINE, undergr, open pit, U_3O_8, V_2O_5
Geol: Leland Davis
Elec Eng: L O Leon
Mine Supt: James E Potter
Mech Eng & Mine Frm: Lionel J Bradford
Prod: 10 tons
(See Utah)

METRO MINERALS & EXPLOR, INC
5615 Sunset Drive, Cheyenne
Pres & Gen Mgr: Phil Ruckman
VP: O H Buckles
Sec: Dick Naag
Treas: Howard J Hebert
CHRISTENSEN CLAIMS, Gillette, Pumpkin Buttes area, U_3O_8
Gen Supt: Ted Johnston
Geol: Jim Adsit
Under devel

MID-CONTINENT EXPLOR CO
Sundance
Partners: A J Katchee, H M Brickel
MINES, Bear Lodge Mtns, N of Sundance, niobium, thorium, rare earths, Mn, Zr, Cu, WO_3
Under devel
MINES, U_3O_8
Under devel
(See S D)

NATIONAL LEAD CO, BAROID DIVISION
Osage
CLAY SPUR PLANT
Mine & Mill Supt: Joe Rosetti
MINE, surface, bentonite
PLANT, dry grinding
COLONY PLANT
Mine & Mill Supt: D K Rowand
MINE, surface, bentonite
PLANT, dry grinding
(See Ark, Calif, Kans, La, Mo, Mont, Nev, N Y, Tenn, Tex)

NORAMCO, INC
366 S State St, Salt Lake City
Pres & Gen Mgr: L P Athas
Sec: Francis C Lund
HOPE NO 9 MINE, Gas Hills Mng dist, Fremont County, open pit, U_3O_8
Under devel
(Under contract for drilling & mng by Lost Creek Oil & Uranium Co, Rawlings)

NORBUTE CORP
215 N 5th, Grand Junction, Colo
LEASES, Fremont, Sublette, & Carbon Counties, U_3O_8
(See Utah)

NORTH AMERICAN URANIUM, INC
Box 484, Jamestown, N Dak
Pres & Gen Mgr: J H Archer
VP: Paul R Regan
Sec-Treas: John Hjellum
KEY MINES, Gillette, open pit, U_3O_8
Gen Supt: Kenneth Evans
Mine Supt: Edward Eric
Mine Frm: W D Davidson
Prod: 15 tons
(See N Dak)

OLD FAITHFUL URANIUM CORP
300 Consolidated Royalty Bldg
Casper
Pres & Gen Mgr: C M Buescher, Jr
VP & Purch Agt: W F Swanton
Sec-Treas: Jane Bailey
CANNON BALL MINE, Box 487, Douglas, open pit, U_3O_8, V_2O_5
Asst Gen Mgr: James A Smathers
Mech Eng: J J Mair
Mine Frm: Cal Gurwell
Prod: Nil tons
MINE, Lance Creek area, open pit, U_3O_8, V_2O_5, selenium
Under devel

JOHN PETERSON ASSOCIATES
209 Alton Banking & Trust Bldg
Alton, Illinois
URANIUM Prod

PLATT, R H & MORRIS, H V
Encampment
PLATT MINE

PUMPKIN BUTTES MNG & EXPLOR CO
Hot Springs, S Dak
Pres: Don Wheeler
Sec-Treas & Gen Mgr: I J Hauptmann
COLD SPOT MINE, Gillette, at Earl Brown ranch, Campbell County, open pit, U_3O_8, V_2O_5

RUBY COMPANY
Lander & Laramie
(See J R SIMPLOT COMPANY)

RUSTLER MNG CO
835 E 3rd, Casper
Pres: Fred Hartnett
VP: Wm T Deacon III
Geol: J H Bright
MINE, in Idaho
(See Idaho)

SAN FRANCISCO CHEMICAL CO
Drawer P, Montpelier, Idaho
LEEFE MINE, 2 mi NW of Sage
surface, phosphate
Mine Supt: Preston S Pugmire
Mine Frm: Frank Buck
Prod: 1,000 tons
(See Idaho, Utah)

SAN JUAN URANIUM EXPLOR INC
718 Kittredge Bldg, Denver 2, Colo
MINE, Pumpkin Buttes, open pit, U_3O_8
Gen Mgr: Wm C Chadwell
Gen Supt: Robert E Pierce
Geol: Earl N Murray
Mine Supt: Paul B Chadwell

SHAWANO DEVEL CORP
430 Park Ave, New York 22, N Y
MINE, Baggs, in Poison Basin area W of Baggs, U_3O_8

SHIRLEY MOUNTAIN MNG CO
520 E Main, Riverton
Managing Part: S J Stanbury
MINE, Bald Mountain at S edge of Shirley Basin, open pit, U_3O_8, V_2O_5

SHONI URANIUM CORP
520 E Main, Riverton
Pres: Vern Hughes
VP: Roy Peck
Sec-Treas: J Neese
MINE, Gas Hills, open pit, U_3O_8, V_2O_5
Geol: Ralph Thurston
Under devel
MINE, in E Gas Hills, 45 mi SE of Riverton, open pit, U_3O_8, V_2O_5
Geol: Leigh Roach
Under devel

J R SIMPLOT COMPANY
Executive Office, Continental Bank Bldg, Boise, Idaho
EXPLORATION for Ruby Company, Lander & Laramie
(See J R SIMPLOT COMPANY, Idaho)

SODAK URANIUM & MNG CO, INC
Evans Hotel Annex, Hot Springs, S Dak
BUSFIELD MINE, Crook County, open pit, U_3O_8, V_2O_5
Gen Mgr: C R Boyle
Geol: Ralph B Hall
Supt: Harold Duncan
Mine Frm: Richard Duncan
Prod: 80 tons
HERR McGEE LEASE, Converse County, open pit, U_3O_8
Under devel
(See S Dak)

SPLIT ROCK MNG & EXPLOR CO
P O Box 589, Kemmerer
Pres & Gen Mgr: Norman M Harrower
VP: Karl Model
Sec-Treas & Asst Gen Mgr: Robert M Harpower
SUN DOG MINE, Home on the Range, Lander, Crook's Gap area, Fremont County, undergr, open pit, U_3O_8
Under devel

STANBURY MNG CO
520 E Main St, Riverton
(See Veca Minerals Co)

STATES MINES, INC
Box 522, Lander
Gen Mgr & Part: B Blonder
Part: D A Boyd
Sec-Treas: D L E Pratt
MINE, open pit, U_3O_8, V_2O_5
Prod: 70 tons shipped

SUNDANCE PETROLEUM & URANIUM CO
Box 298, Spearfish, S Dak
TURNERCREST NO 1 MINE, U_3O_8
Gen Mgr: Joseph R Gray, 263 S. Nebraska, Casper, Wyo
(See S Dak)

SUPER CUB MNG CO
P O Box 1067, Greybull
URANIUM Prod

SUSAN B URANIUM CORP
34 Prospectors Lodge, Moab, Utah
CLAIMS, U_3O_8, WO_3
(See Ariz, Colo, Utah)

TREBELCOCK & KNIGHTEN
Buffalo
Pres: Robert I Trebelcock
VP: Dallas Knighten
LUCKY SEVEN MINE, open pit, U_3O_8
HARD LUCK MINE, open pit, U_3O_8
Under devel

TWO STATES URANIUM CO
Bountiful, Utah
REDWOOD MINE, Gas Hills area, U_3O_8
Prod: 1,000 tons per month
(Co-owner with Hughes Mng Co)

U S STEEL CORP, COLUMBIA-GENEVA STEEL DIV
120 Montgomery St, San Francisco, Calif
EXPLOR, West Wyoming, near Lander
(See Alaska, Ala, Calif, Minn, Pa, Tenn, Utah)

VECA MINERALS CO
520 E Main St, Riverton
Managing Part: S J Stanbury
Part: Vern Hughes
MYRNA LYNN MINE, East Gas Hills, open pit, U_3O_8
Prod: 100 tons
(Owned equally by Hughes Mng Co & Stanbury Mng Co)

VIPONT MNG CO
P O Box 602, Lander
Pres: Alfred Ellerby
VP: Wm J Morey
Sec-Treas: L V Abbott
ROCK HILL MINE, Gas Hills, Fremont County, U_3O_8
Mine Eng: Wm J Morey
Under devel

VITRO MINERALS CORP
600 W 33rd S, Salt Lake City Utah
Pres: C J Potter
VP: W B Hall
Sec: W H Dense, Jr
Treas: R T Ruder
SATECO PROPERTIES, Fremont County, surface, U_3O_8, V_2O_5
Gen Mgr: J O Horton
Gen Supt: Roy Coulson
Geol: D L Welsh
Mech Eng: G Quigley
Prod: 100 tons
(See Vitro Uranium Co, Utah)

WASHAKIE MNG CO
1250 Odel, Thermopolis
Pres & Gen Mgr: John A Wells
VP & Asst Gen Mgr: Jack Kyser
Sec-Treas: Roberta Kyser
Geol: Charles Massey
Mech Eng: Leo Hinklemeyer
Drilling Frm: Bob Hargraves
UREKA 25, Fremont County, Gas Hills area, open pit, U_3O_8
Prod: 50 tons

WESTERN ENGR CORP
P O Box 8, Douglas
Pres & Geol: R L Peterson
VP: Bruce Anderson
Sec: B J Peterson
Driller: Virgil Geerke
Asst Driller: John Townsend
PROPERTIES, drilling & explor

WESTERN METALS INC
519 Spruce St, Rawlins
Pres: Robert W Adams
VP: Wm T Adams
Sec-Treas: Ed A Smyth
Exec VP: Wendell W Fertig
Asst Gen Mgr: J F Whalen
Acting Mine Geol: Eric Newman
Mine Eng: R T Brown
SNO-BALL McINTOSH LEASE
Crooks Gap, open pit, U_3O_8
(Prod planned by June 1957 - 50 tons daily)
Under devel
BULLRUSH MINE, Gas Hills area open pit, U_3O_8
(Prod planned by May 1957 - 200 tons daily)
Under devel
FRAZIER-LEMAC MINE, Gas Hills area, open pit, U_3O_8
(Prod planned by July 1958 - 300 tons daily)
Under devel
440-TON MILL, Split Rock, acid leach, R.I.P.
Mill Supt: Graydon Sallee

WHEELER, DON
Wauneta, Nebraska
URANIUM Prod

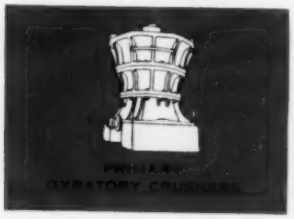
WYODAK CHEM DIV, PED FOUNDRY SUPPLY CO
4600 E 71st St, Cleveland, Ohio
Pres: Elmer Ditty
VP & Gen Mgr: L H Hoyl
Sec: Peter Reed
Treas: Geo E Tate
Purch Agt: J E Hollmeyer
MINES, Crook & Weston Co's surface, bentonite
Mine Supt: John T McKean
Prod: 700 tons
DRYING & PULVERIZING MILL, near Upton
Mill Supt: Carl Barritt

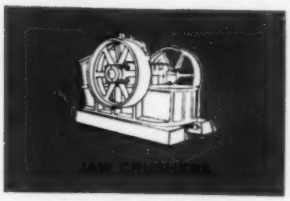
WYOMING URANIUM CORP
Box 24, Lander
Pres: Hepburn T Armstrong
VP: T S Armstrong
Sec: Beatrice H Armstrong
DRILLING, U_3O_8

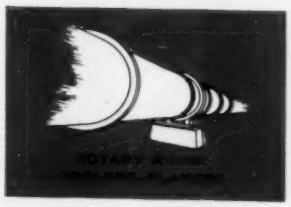
Traylor

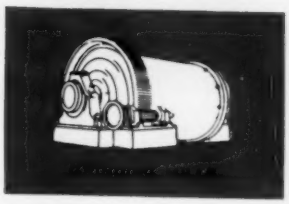
CRUSHING · GRINDING · PROCESSING

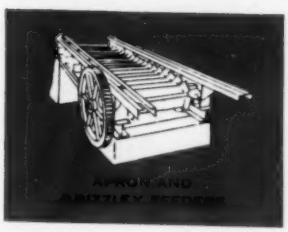
MACHINERY FOR THE MINING INDUSTRY









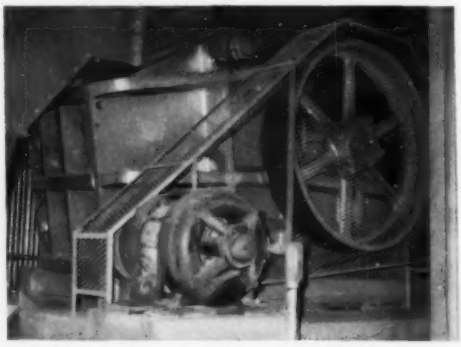


Traylor-MADE MACHINERY IS US
FOR ITS OPERATING ECONOMY, THRIF

TF
Fine Reduction Crusher offers a range of product sizes from 1/4" to 1½"

A Traylor-Made Machine is best for you, too.

At Traylor, every order receives individual attention. Every machine is particularly Traylor-Made to meet the requirements of the job for which it is intended. In this way every Traylor operator enjoys the maximum operating efficiency that only a machine specially built for its job can deliver. No inquiry is too small to receive the close personal attention of Traylor's experienced engineers, no order is too large for Traylor's modernly equipped plant to produce on schedule. Write for complete information on any Traylor Machine, outlining your requirements as fully as possible. Traylor's engineering staff, with over half a century of experience behind it, will recommend the equipment you should buy. There's no obligation.



REDUCTION CRUSHERS

Almost a thousand Traylor TY Reduction Crushers are already in operation throughout the world. They are well known for their ability to produce a highly uniform product with a low percentage of waste fines. Traylor TY Crushers are built in 6 sizes with capacities ranging from 6 tons of 1/4" product to 590 tons of 3-1/2" product per hour. Bulletin #8112 gives complete specifications.

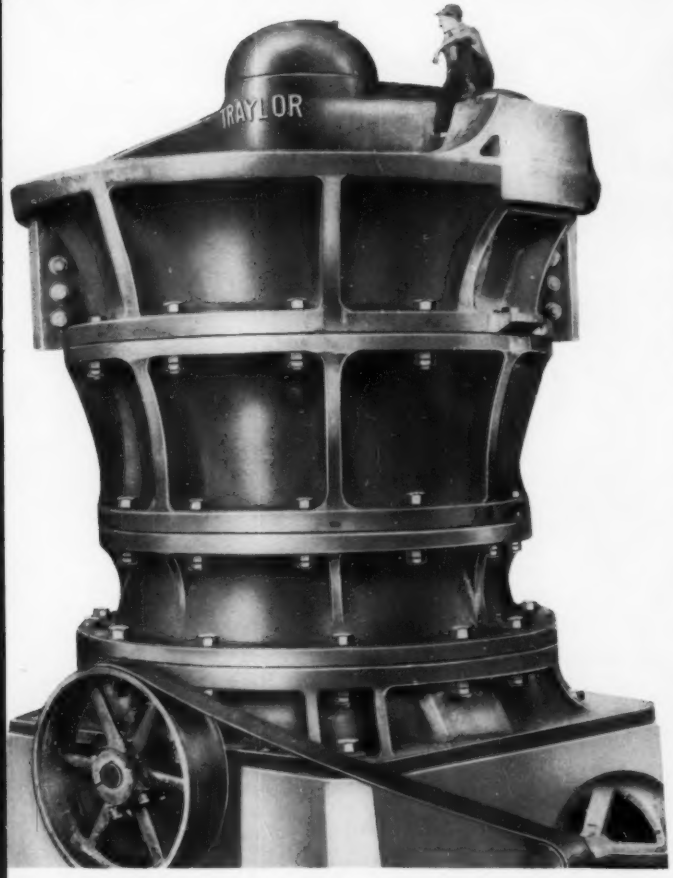
Both Traylor TF and TY Reduction Crushers have many advanced design features. An all cast steel frame with upper shell and spider in one piece assures great strength. Self-tightening bell head and curved concaves produce maximum power efficiency. An all around bottom discharge avoids packing or choking. Spring mounted shaft protects against tramp iron. Bronze bushed eccentric promises long service. A closed circuit, force feed lubricating system offers easier starting and smoother, trouble-free operation. Machine cut steel gearing. Self-contained countershaft bearing is fitted with roller bearings. Traylor TF Reduction Crushers are fully described in Bulletin #127.

JAW CRUSHERS

Traylor Jaw Crushers are the product of over half a century of experience building machinery to withstand the rugged demands of the mining industry. They are rugged, but efficient. They are precision built, but durable.

All frames are reinforced at critical points to provide strength without excessive weight. Whenever necessary to make frames in more than one piece, the sections are joined in a way to preserve the rigidity of a single casting. Traylor's patented swing jaw suspension, along with Traylor originally developed curved jaw plates, account for greater capacity at finer settings and longer life of jaw plates. Traylor's curved jaw plates will often outwear conventional plates 3 to 1.

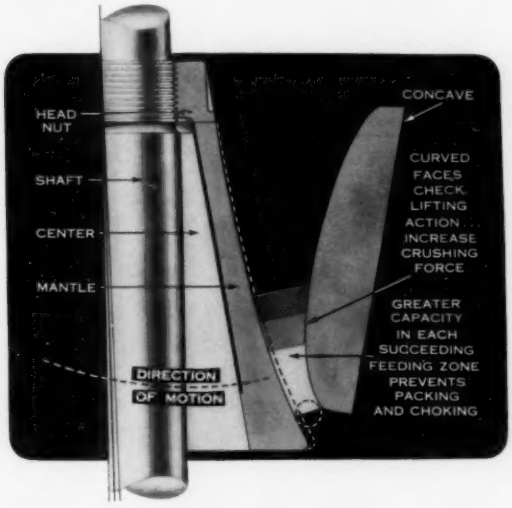
BY THE WORLD'S BIGGEST PRODUCERS OF MAINTENANCE AND PEAK PRODUCTION



60" Gyratory being tested in shop before shipping.

All Traylor Crushers Offer the Operating Efficiency and Economy of Curved Crushing Surfaces

Curved crushing surfaces are an original Traylor development that results in power economy plus a high rate of production. Traylor's curved crushing surfaces are scientifically shaped so that the faces are opposed to the direction of motion. Power requirements are reduced, even at finer settings, because more of the power applied is used as a direct crushing force. This also reduces slippage between material and crushing surfaces, greatly increasing the life of these parts. By increasing the capacity of each succeeding feeding zone in the crushing chamber, choking and packing are practically eliminated.



Traylor Jaw Crushers are built in 5 types, offering 18 different size feed openings. Capacities range from 4 tons of 7/8" material to 1000 tons of 11" material per hour. Bulletins give complete specifications on all 5 types of Traylor Jaw Crushers. Give a brief outline of your requirements and the bulletin describing the Traylor Jaw Crusher best suited to your needs will be forwarded.

GYRATORY CRUSHERS

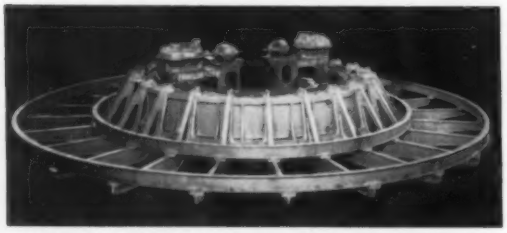
The Traylor TC Gyratory is the most advanced gyratory available, as evidenced by the fact that over 45 of the larger sizes have been built for many of the largest mining operations throughout the world. They are built in 6 sizes with capacities ranging from 245 tons of a 2" product to 4100 tons of an 11" product.

In the Traylor TC Gyratory the production-minded operator has maximum efficiency, capable of producing thousands of tons of material per hour. Its rugged construction includes: mass for shock absorption; a straight line bar type spider; an extra short main shaft of maximum diameter and strength; and a long, large diameter bronze bushed eccentric which reduces bearing pressure to the minimum. Closed circuit, force feed lubricating system assures easy starting and reduced maintenance over long periods of heavy duty operation.

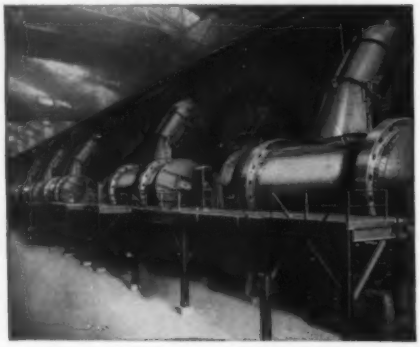
The Traylor TC Gyratory is built with Traylor's original bell head and curved concaves which have established a world-wide reputation for their efficient application of power.

Bulletin #1126 gives complete specifications on Traylor TC Gyratory Crushers.

ROTARY KILNS Rotary Kilns for calcining, roasting and chloridizing, volatilizing, sintering and nodulizing. Shells are made of heavy steel plates welded together. Alignment is readily maintained by easily adjustable supports. Full floating type riding rings, attached to the shells without bolts or rivets, are turned true and smoothly faced. Steel main gears and pinions are generated to a special design in Traylor shops. Both sides of the main gear teeth are faced for extra wear. Sizes have been made to 12′-0″ diameter, 450′-0″ long. More details are contained in Bulletin #1115.



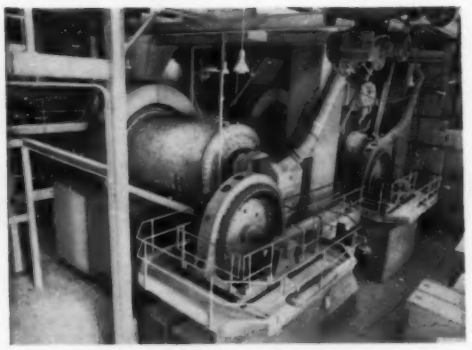
CASTING MACHINES Traylor builds circular casting machines that are known all over the world; anode, cathode, wire bar or pigs. Sizes have been built up to 40′-0″. Write for additional details.



Converter aisle at plant of world's largest nickel producer.

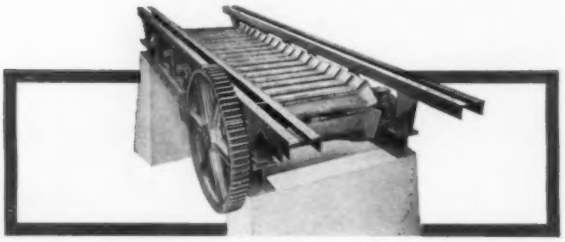
CONVERTERS Traylor has supplied the world's leading copper and nickel producers with Pierce-Smith type converters in sizes up to 13′-0″ x 35′-0″. Write for more complete information.

Traylor also builds stone and ore scrubbers, smelting furnaces and many smelting accessories. Write concerning your requirements.

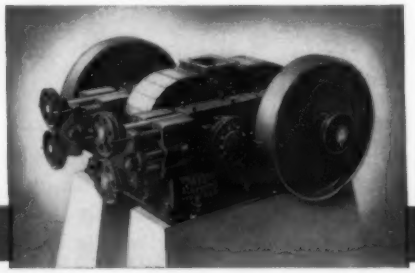


GRINDING MILLS Shells are of all welded heavy steel plate. Shell liners are made in sections of reasonable weight of either high carbon rolled steel, manganese steel or high carbon cast steel. Driving gears are precision cut on a Maag gear generator. On large mills main bearings are oil lubricated and are fitted with a high pressure pump which coats the trunnions with a film of grease to lift and float the mill, overcoming high starting torques and eliminating undue wear caused by "dry" starting. Traylor builds ball mills, rod mills, compartment mills, tube mills and pebble mills covering a wide range of wet or dry, coarse or fine grinding operations. Traylor engineers will recommend the type best suited to your needs.

FEEDERS Traylor builds both apron and grizzly types. Both are heavy duty feeders recommended for use with all types of crushers. Complete details are provided in Bulletin #2114.



CRUSHING ROLLS Traylor builds 3 types of rolls. The four tension rod type is intended for extra heavy duty and is of unusually massive proportions to provide pressures up to 30,000 lbs. per lineal inch of roll face. Type A and AA Rolls are designed for lighter service. All three types of Traylor Rolls are described in Bulletin #5637.



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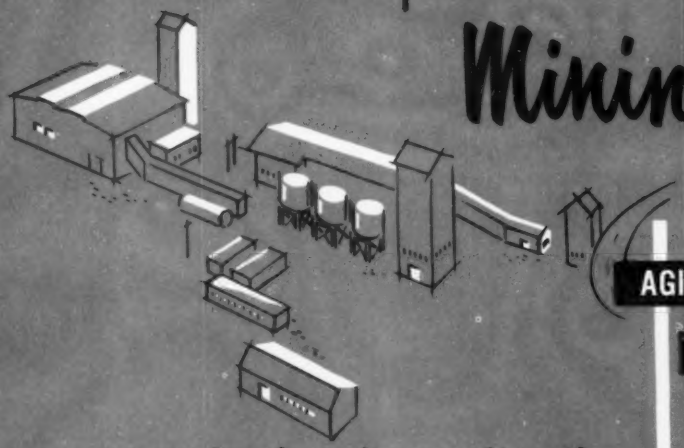
DORR-OLIVER

equipment and methods for the Mining Industry

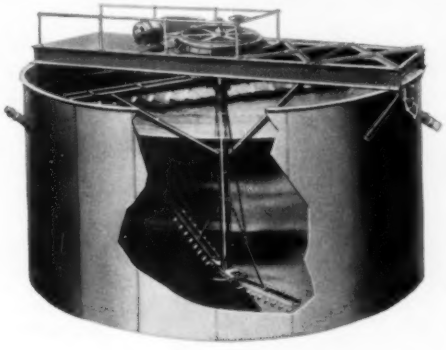


covering the unit operations of . . .

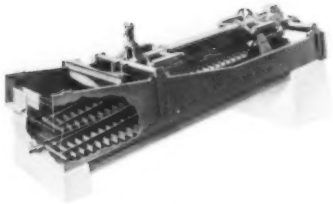
- AGITATION
- CLASSIFICATION
- FILTRATION
- THICKENING
- ROASTING
- SLURRY HANDLING

Worldwide Engineering, Equipment and Manufacturing Facilities are available through any of the Offices listed on the back cover . . .

THE DORR AGITATOR . . . utilizes combination of air and mechanical agitation to maintain homogeneous mixture by means of air lift column. Ideal for continuous leaching, washing, and slurry correction and blending.



CLASSIFICATION



The Dorr Type H Classifier

THE DORR CLASSIFIER . . . first machine to put classification on a continuous, mechanical basis and still the standard unit for wet separations in the 28 to 200 mesh range. Now available with Type H mechanisms in a complete range of sizes.

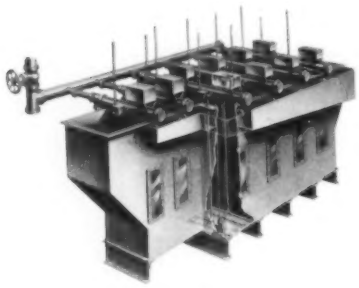
THE DORR BOWL CLASSIFIER . . . incorporates standard machine with shallow, circular bowl for separations in 65 to 325 mesh range.

THE DORR HYDROSEPARATOR . . . for large volume flow or exceptionally fine separations.

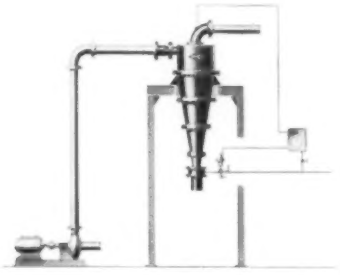
THE DORRCO JET SIZER . . . multiple-spigot, hindered-settling classifier featuring low operating cost and extreme flexibility of cell arrangement.

DORRCLONE AND CENTRICLONE CLASSIFIERS . . . a a complete range of wet cyclones in diameters from 10 mm to 24 in. . . . both single and multiple unit installations.

DORRCO PAN-AMERICAN JIGS . . . mechanically actuated, fixed screen Placer Jig for alluvial recoveries, grinding mill circuits and coarse ore concentration. Hydraulically actuated Pulsator Jig for roughing in open and closed circuit grinding systems and for roughing and cleaning in placer operations.



The Dorrco Jet Sizer

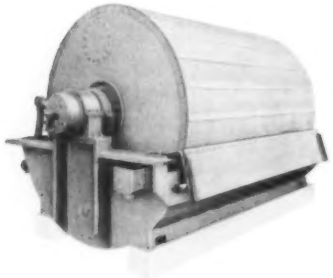


The DorrClone

FILTRATION

THE OLIVER FILTER . . . first machine to put vacuum filtration on a continuous basis and still the standard filter for washing cyanide slurries. Available in sizes ranging from 3 to 790 sq. ft. of filtering area and with a variety of discharge methods depending on cake characteristics.

THE AMERICAN FILTER . . . ideal for de-watering slurries which form relatively thick cakes. Features big savings in floor space and can be compartmented to filter two or more products on the same machine.



The Oliver Filter

The American Filter

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FILTRATION
Continued

THE DORRCO FILTER... low maintenance unit where filtering takes place on the inside of the drum which also acts as the filter tank. Especially suited for de-watering fast-settling solids such as magnetites, lead sulfides, etc.

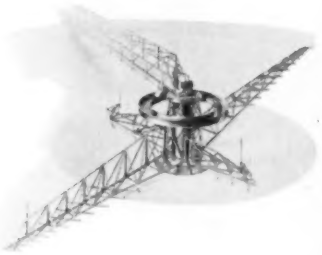
THE OLIVER HORIZONTAL FILTER... capable of counter-current washing in a single unit. Ideal for relatively slime-free slurries which form thick cakes.

THE SWEETLAND FILTER... a quick opening batch pressure filter with individual sight glass on each leaf. Good for leaching operations and where % solids in feed is insufficient to form a dischargeable cake on a continuous unit.

The Dorrco Filter

THICKENING

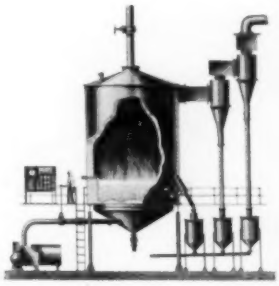
DORR THICKENERS... center shaft, center pier and traction units in a wide range of types and sizes to handle every thickening or clarification problem. Individual units available to handle from one to 25,000 tons of solids in feed per day. Can be arranged in trays for counter-current washing, parallel thickening or a combination of both in a single unit.



The Dorr 4-Arm Torq Thickener

ROASTING AND CALCINATION

DORRCO FLUOSOLIDS SYSTEMS... the most significant advance in roasting techniques in the last 30 years. For roasting sulfides for metal recovery, for SO_2 production for acid manufacture, for roasting gold ores prior to cyanidation, for heat treatment steps in the concentration of various ores.

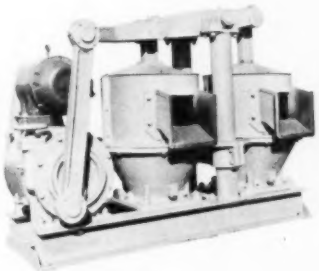


The Dorrco FluoSolids System

PUMPING

THE OLIVER DIAPHRAGM SLURRY PUMP... variable volume pump from zero on up. Discharge can be shut off while pump is running. Operates on compressed air with no mechanical linkage. Ideal for dense slurries.

DORRCO V-TYPE AND W-TYPE PUMPS... for positive, controlled removal of settled solids from Thickeners and Hydroseparators. Can be used as meters ahead of further treatment.



The Dorrco W-Type Pump

THE SCOPE OF THE DORR-OLIVER TECHNICAL SERVICE

The fundamental objective of Dorr-Oliver is the most economical solution to your processing problem. A worldwide engineering organization enables us to serve the mining industry wherever metallic and non-metallic minerals are mined or beneficiated. This complete service, all or any part of which may be brought to bear selectively on your problem, includes:

laboratory testing

Complete laboratory work to investigate the fundamentals of the problem.

pilot plant demonstration

Proving of the process on a scale approaching commercial application to accurately determine equipment sizes and operating factors.

flowsheet preparation

Preparation of process flowsheets based upon testing, pilot plant demonstration or existing data.

economic analysis

Preparation of estimates covering installed cost of complete plant and economics of operation to determine feasibility of project on a commercial scale.

plant design and specifications

Design of the complete plant and preparation of complete specifications for all process equipment, utilities and structures.

purchase of equipment

Purchase of all equipment by whatever arrangement best suited to the particular project and mutually desirable to client and Dorr-Oliver.

plant construction

Responsibility for construction of entire plant or any portion thereof, including erection and installation of all equipment.

supervision of initial operation

Supervision of initial plant operation on a commercial basis and instruction of client's operating personnel.

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Corpus Christi, 416 No. Chaparrel St.	Tulip 3-8521
Dallas 2, 1800 N. Market St.	Riverside 2-7144
El Paso, 215 N. Stanton St.	El Paso 5-9537
Fort Worth 1, 408 West 7th St.	Edison 2-8331
Houston 2, 1104 Dowling St.	CApital 5-0691
San Antonio 5, 902 Frost National Bank Bldg.	CApitol 7-7022
UTAH	
Salt Lake City 1, 136 S. Main St.	Empire 3-1723
VIRGINIA	
Richmond 19, 700 East Franklin St.	3-6646
WASHINGTON	
Seattle 1, 1318 4th Ave.	Main 3797
Spokane 1, West 422 Riverside Ave.	Madison 4-0185
WEST VIRGINIA	
Charleston 1, 179 Summers St.	Dickens 3-9505
WISCONSIN	
Appleton, 1000 West College Avenue	Regent 4-4577
Milwaukee 3, 2040 West Wisconsin Avenue	WEst 3-1736
CANADA	
Montreal, Quebec, 4104 St. Catherine St. W.	Wellington 7345
Toronto, Ontario, 629 Adelaide St. W.	Empire 4-0486
Winnipeg, Manitoba, 56 Albert St.	92853-5
Calgary, Alberta, 709-8th Ave. W.	26978
Vancouver B. C., 1200 W. Pender St.	Tatlow 4728

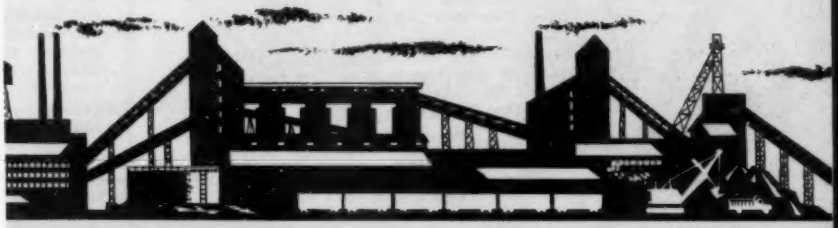
Distributors in all principal cities throughout the United States

Offices and distributors located throughout the world.

ALLIS-CHALMERS

equipment for the

METALLIC MINERALS INDUSTRIES



Allis-Chalmers is the world's largest manufacturer of equipment for the mineral industries. The wide variety of A-C products has brought together one of the most diversified groups of engineering specialists in all industry. That means you can get expert equipment recommendations from A-C.

There's no guesswork when you specify Allis-Chalmers Engineering. The A-C staff, working with your staff, analyzes your problem or process and looks for ways to make *existing* equipment "team up" with the new equipment for greater production. And the recommendation will be unbiased, because A-C builds many types and sizes of equipment. The selection will be dictated by *exactly what you need*, not an improvised arrangement.

Trained engineers in the Allis-Chalmers Research Laboratories help solve tough problems by testing samples of your product. This is another precaution to make sure that exactly the *right* equipment is selected for your particular plant.

And Allis-Chalmers not only builds the *basic* machinery, but *also* the motors, drives and control needed to run it—it is the only company that builds all this machinery in its own shops. This means a "packaged" unit or process, with every part *engineered* to work efficiently with every other . . . assures you of higher efficiencies, lower costs, undivided responsibilities. And Allis-Chalmers stands behind every unit 100%!

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

985 South 70th Street, Milwaukee, Wisconsin

25C7949C

VIBRATING SCREENS . . . a complete line

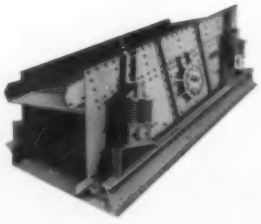
SELECTION GUIDE for metallic minerals industry

Vibrating Screen Applications	Maximum Feed Size (inches)	Aperture Range (inches)	Screen	Common Sizes (feet)
Scalping—ahead of Jaw Crushers	36	3 to 10	ROM Model XXH	5 x 10 to 6 x 14
Scalping—Following primary crushers	20	1 to 5	Model XH	4 x 5 to 6 x 16
Scalping—Following secondary crushers or hammermills	6	¼ to 5	Model SH	3 x 6 to 6 x 16
Dry Sizing	6	40 mesh to 5	Model SH	3 x 6 to 6 x 16
Dry Sizing	5	⅛ to 2½	*Low-Head*	3 x 6 to 6 x 20
Dry Sizing	4	40 mesh to 3	Model S	3 x 6 to 4 x 10
Dry Sizing	4	40 mesh to 1½	Model AVS	3 x 6 to 4 x 10
Wet Sizing and Washing	6	40 mesh to 5	Model SH	3 x 6 to 6 x 16
Wet Sizing, Washing and Dewatering	5	¼ mm to 2½	*Low-Head*	3 x 6 to 6 x 20
Wet Sizing	4	40 mesh to 3	Model S	3 x 6 to 4 x 10
Wet Sizing	4	40 mesh to 1½	Model AVS	3 x 6 to 4 x 10
Media Recovery and Washing	8	¼ mm to 2 mm	*Low-Head*	3 x 12 to 6 x 20
Thickening, Dewatering and Filtering	⅜	⅛ mm to 1 mm	*Low-Head*	3 x 12 to 6 x 16

STANDARD ALLIS-CHALMERS VIBRATING SCREENS

Model XXH ROM inclined screens

For the heaviest scalping problems



Model XXH ROM screens are of heavy steel construction with balanced, two-bearing cartridge-type mechanism. May be obtained with plate or stepped grizzly bar decks. Max. opening — 10 to 11½ inches . . . 1 or 2 decks. Send for Bulletin 07B8368.

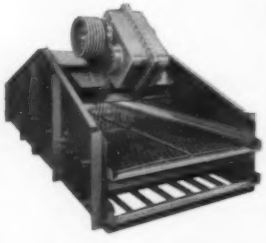
Model XH Extra Heavy Duty inclined screens

For wet or dry scalping and coarse sizing

Model XH *Ripl-Flo* screens have balanced two-bearing mechanisms and may be obtained with perforated plate, rod or stepped grizzly bar decks. Max. opening — 5 inches . . . 1, 2 or 3 decks. Send for Bulletins 07B6151 and 07B7868.

Low-Head Heavy Duty horizontal screens

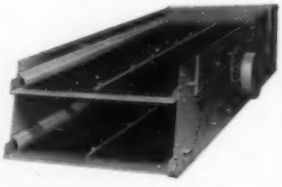
For moderate to heavy sizing, coarse to fine, wet or dry, thickening dewatering, media recovery and rinsing.



Low-Head screen operation saves headroom and space. Conveniently mounted mechanism imparts a straight line motion to screen. Max. opening—2½ inches . . . 1, 2 or 3 decks. Send for Bulletins 07B6330 and 07B7868.

Model SH Standard Heavy Duty inclined screens

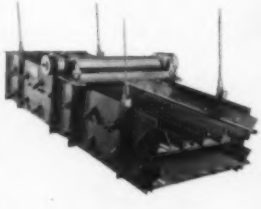
For moderate to heavy sizing, coarse to fine, wet or dry, light scalping and rinsing



Model SH *Ripl-Flo* screens have balanced, two-bearing mechanism and are designed for a wide range of applications. Max. opening—5 inches . . . 1, 2 or 3 decks. Send for Bulletins 07B6151 and 07B7868.

Model AVS Standard Duty inclined screens

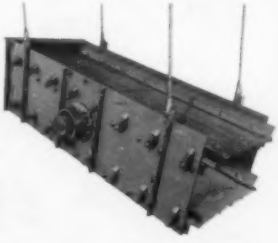
For fine sizing, wet or dry



Model AVS *Aero-Vibe* screens have two-bearing mechanism located above the body. Gives top screening efficiency at lowest possible cost. Max. opening—1½ inches . . . 1, 2 or 3 decks. Send for Bulletin 07B6099.

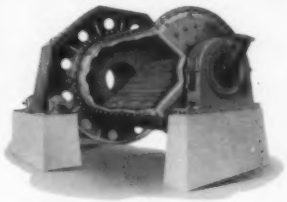
Model S Standard Duty inclined screens

For moderate, wet or dry sizing



Model S *Ripl-Flo* screens are sturdy, low cost screens . . . have two-bearing mechanism. Max. opening—3 inches . . . 1, 2 or 3 decks. Send for new Bulletin 07B8229.

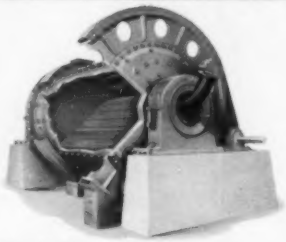
GRINDING MILLS . . . all types



Overflow Rod Mill

Sizes 3 to 11½ ft diameters, 6 to 16 ft lengths. Rod mill product can be varied from 6 to 35 mesh, with a minimum amount of fines. Because a rod mill can reduce a one inch slot size feed, it has supplanted the last stage of crushing in many plants. The screening action of the rods within the mill produces an ideal ball mill feed, free from tramp oversize, without the use of close circuiting screens.

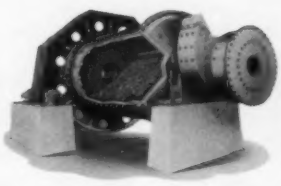
Bulletin 07B6718.



Peripheral Discharge Rod Mill

Sizes 3 to 11½ ft diameters, 6 to 16 ft lengths. The peripheral discharge rod mill was developed for those dry grinding circuits where close control is required for either the product top size or the fines. In addition to these dry grinding applications, either the end peripheral or the center peripheral discharge rod mill may be used in wet circuits where specific product requirements must be met.

Bulletin 07B6718.



Ball Mills

Sizes 3 to 13 ft diameters, 3 to 17 ft lengths. For producing a finely ground product of 28 to 325 mesh from a feed size of about ½ inch. Ball mills are unsurpassed for the fine grinding of moderately to extremely abrasive materials.

Overflow type ball mills are used for fine wet grinding in closed circuit with a classifier. Diaphragm type ball mills are universally used for fine or coarse, wet or dry grinding in closed circuit with a classifier, screen or air separator.

Bulletin 07B6718.

Other Equipment

ROTARY KILNS . . .
For sintering, nodulizing, pelletizing, agglomerating, calcining

CONVERTERS

BALLING DRUMS

COOLERS . . . DRYERS

HOLDING FURNACES

CONTINUOUS CONTACT COLUMN

BLADE MILLS

CAR SHAKERS

LOG WASHERS

MOTOR-GENERATOR SETS

RECTIFIERS

SWITCHGEAR

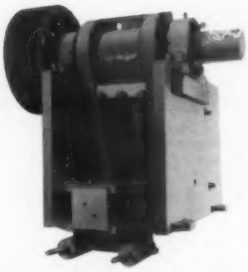
SUBSTATIONS

TRANSFORMERS

TRACTORS AND GRADERS

MOTOR WAGONS

CRUSHERS FOR EVERY MINING JOB



Model ST Jaw Crusher

For crushing moderately hard material with minimum fines. Five sizes . . . 18x30 to 42x54 inch feed openings. Capacity, 75 to 650 tph. Bul. 07B8595.

A-1 Jaw Crushers

For primary crushing of tough, abrasive material in blocky feed sizes. Four sizes . . . 36x25 to 60x48 inch feed openings. Capacity, 200 to 660 tph. Bulletin 07B6369.

Blake Jaw Crushers

For moderate capacity crushing of hard materials. Five sizes . . . 10x7 to 30x18 inch feed openings. Capacity, 6 to 90 tph. Bulletin 07B7090.

Fine Reduction Jaw Crusher

For crushing 7 inch and smaller feed to 50% passing ¼ inch in one operation. Two sizes . . . 18x9 and 24x10 inch feed openings. Bulletin 07B6425.

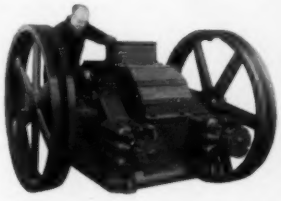
Roll Crushers

For fine crushing of hard material with minimum fines.

Double-roll crushers are driven by large flywheel sheaves. Roll diameters from 9 to 78 inches. Bulletin 07B6180.

For crushing large tonnages of laminar rock.

Single roll *Fairmount* crushers, two sizes . . . 24x84 and 36x60 inch rolls. Write for more information.

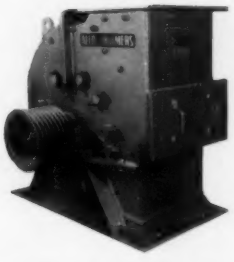


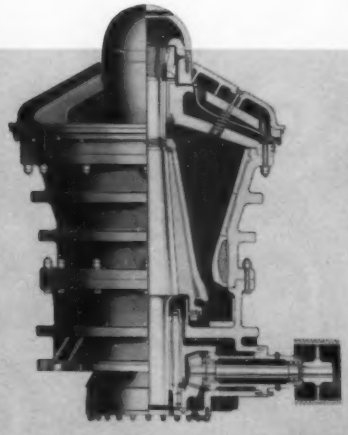
Pulverator Hammermill

For pulverating soft or non-abrasive materials.

Hammers reduce material by multi-impact . . . large ratio of reduction. Handles up to 4 inch feed. Five sizes . . . capacity 2½ to 125 tph.

Send for Bulletin 07B6265





Superior Gyratory Crushers

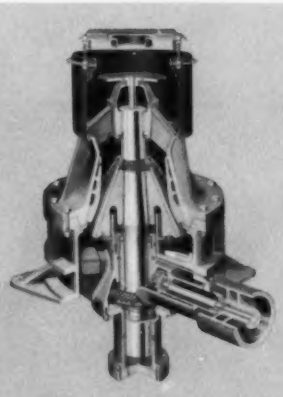
For high capacity primary or secondary crushing. Twelve sizes . . . 16-50 to 60-109 (60 inch feed opening, 109 inch diameter cone at crushing point). Capacity 170 to 3500 tph. Available with *Hydroset* mechanism which compensates for wear, adjusts product size and facilitates clearing of crusher in case of power failure or unexpected shutdown.

Send for Bulletin 07B7870.

Hydrocone Gyratory Crusher

For high capacity secondary or tertiary crushing. Twenty-one sizes . . . 122 to 1784 (17 inch feed opening, 84 inch diameter cone at crushing point). Capacity 7 to 1050 tph.

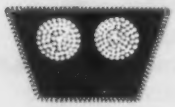
Send for Bulletin 07B7145.



A DRIVE FOR EVERY MACHINE

Texrope—greatest name in V-belt power transmission—is the registered trademark of Allis-Chalmers, originator and pioneer of multiple V-belt drives.

Ask for Bulletin 20C6051, "Handy Guide to Selection of Texrope Drive Equipment"; it tells the complete Texrope Drive story . . . V-belts . . . sheaves . . . and how to figure a Texrope drive.

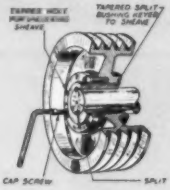


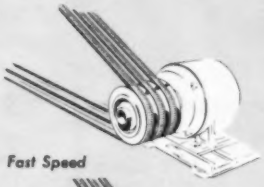
Grommet Belt

Wide Range Belt

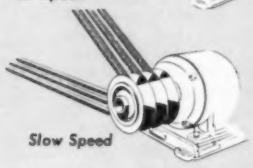
Texrope V-belts

Famous patented grommet construction provides longer life than ordinary V-belts. Made with straight sides for greater grip. Types for all operating conditions: heat-resisting; oil-resisting; static-resisting and special High Capacity. Also available: Texrope wide range V-belts for use with wide range *Vari-Pitch* sheaves and *Vari-Pitch* Speed Changers.





Fast Speed



Slow Speed

Magic-Grip Sheaves

The *Magic-Grip* cast iron sheave provides fast, easy mounting and demounting. Construction is simple, foolproof. Sheave automatically adjusts itself to slightly oversize or undersize shafts. Positive clamp fit on shaft means no weaving—no vibration. There is no back lash—no extra play. Sheave can be mounted closer to motor or machine—reducing strain and stress. Result: bearing pressure eased—bearing life increased.

Stock sizes for drives up to 150 hp. Larger sizes available on order.

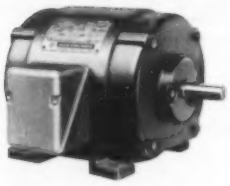
Vari-Pitch Sheaves and Speed Changers

VARI-PITCH SHEAVES are available in two types; Standard Range for A, B, C, D or E belts—capacities from 1 to 300 hp—speed variations up to 28%. Wide Range for Q and R belts—capacities from 1½ to 40 hp—speed variations up to 100%. Both types designed with stationary or motion control features—Stationary Control for infrequent changes when sheave is stopped; Motion Control for repeated speed changes while sheave is in motion.

Vari-Pitch Speed Changers furnish 3¾ to 1 speed ratio in one compact, enclosed unit. Adjustable while in motion. Combines two wide range, worm gear-adjusted sheaves. Manual or pushbutton control.

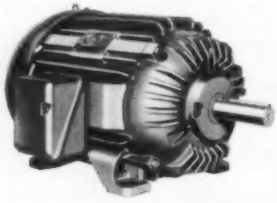
MOTORS FOR EVERY DRIVE

Allis-Chalmers builds a *complete* line of polyphase squirrel cage, wound rotor, synchronous, and direct current motors with electrical and mechanical modifications to meet *any application*. Ask for Bulletin 51C6052, "Handy Guide for Quick Selection of Electric Motors"; it furnishes you with enough facts on Allis-Chalmers motors to enable you to select the type which meets your required electrical and mechanical specifications. The next time you need an electric motor, contact your nearby Allis-Chalmers representative.



Drip-Proof

Small, tough, general purpose squirrel cage motors. All-around protection of inner parts. ½ to 200 hp and up. Also in splash-proof types. Bulletins 51B6210 and 51B7693.

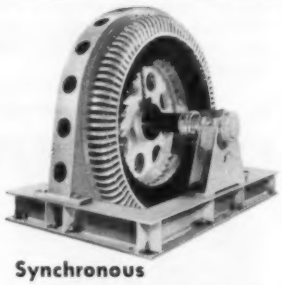


Enclosed Fan-Cooled

Protected from dust, grit, vapor, gases. Cooling air circulated around exterior. ½ to 100 hp. Bulletin 51B7225. Also in new tube cooled type to 3000 hp.

Wound Rotor

For adjustable varying speed service. High starting torque, low starting current. Bulletins 51B-6052 and 05R8183.



Synchronous

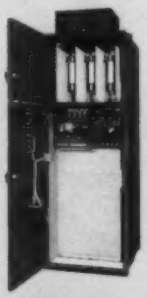
High torque motors of constant speed, available in ratings of 40 hp and larger. End shield bearing, pedestal bearing and engine types.

Large Induction

Drip-proof or splash-proof. 60 hp at 300 rpm to 200 hp at 1800 rpm. Bulletins 05B7542. Pedestal bearing types, 05B7771.

CONTROL FOR EVERY MOTOR

Allis-Chalmers makes a line of starters to meet practically all motor control needs. Count on this wide range of starters, backed by industry-wide application engineering experience, for the answer to your control needs. Ask for Bulletin 14B7733.



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985 South 70th Street
MILWAUKEE 1, WISCONSIN

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EIMCO ROCKERSHOVELS AND AIR LOCOMOTIVES

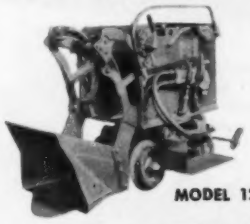
MODEL 12B — Air or electric powered. Loading speed 20 to 35 cu. ft. per min. Dimensions: Width 28". Caging Length (bucket down) 73"*. Head room 78½"*. Clean-up range 83"†. Weight 4500 lbs. Track gauges 15" to 36".
***Standard** **†Without side plow**

MODEL 21 — Air or electric powered. Loading speed 35 to 50 cu. ft. per min. Dimensions: Width 33½". Caging length 55". Length (bucket down) 87"*. Headroom 88"*. Clean-up range 98"†. Weight 7200 lbs. Track gauges 18" to 48".
***Standard** **†Without side plow**

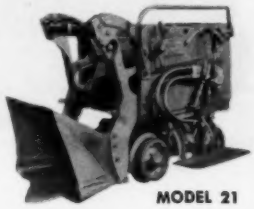
MODEL 40H — Air or electric powered. Loading speed 60 to 100 cu. ft. per min. Dimensions: Length (bucket down) 20'8½". Headroom 8'0". Belt width 28". Clean-up range 12'. Weight 16,850 lbs. Track gauge 28" to Std. Railroad. Wide gauge can be built to tram on 24" gauge.

MODEL 15 — Electric or gasoline powered. Rubber tired. Hopper or conveyor. Loading speed 20 to 40 yards per hour. Dimensions: Width 5'9". Length 10'2". Weight with hopper 8000 lbs., with conveyor 9310 lbs.

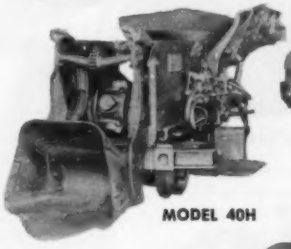
AIR LOCOMOTIVES — Two speed constant mesh transmission. Inspected and serialized to meet A.S.M.E. unfired pressure vessel code. Two sizes. Dimensions: Receiver size 32" x 84"(1) or 40" x 84"(2). Width 32"(1) or 40"(2) Height above rail 48½ (1 or 2). Wheelbase 30" (1 or 2). pressure psi 110 (1 or 2). Weight 2790 lbs. (1) or 3260 lbs.(2).



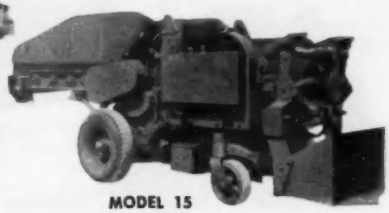
MODEL 12B



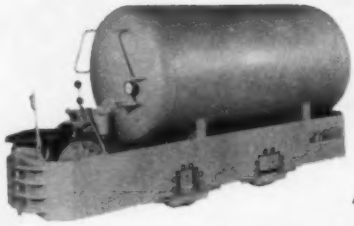
MODEL 21



MODEL 40H

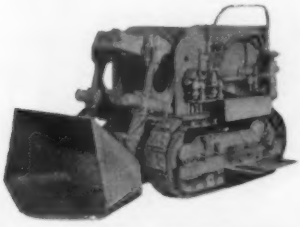


MODEL 15

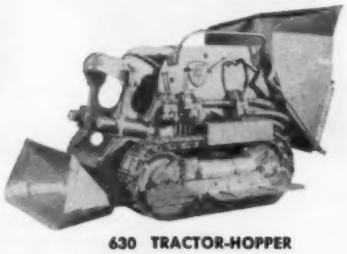


AIR LOCOMOTIVES

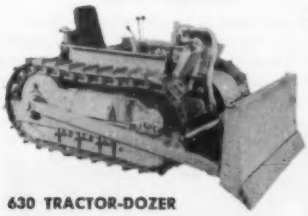
EIMCO 630 TRACTOR SERIES



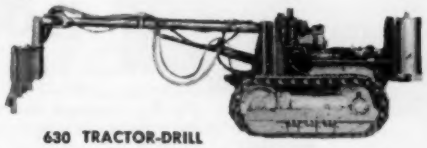
630 TRACTOR-EXCAVATOR



630 TRACTOR-HOPPER



630 TRACTOR-DOZER



630 TRACTOR-DRILL

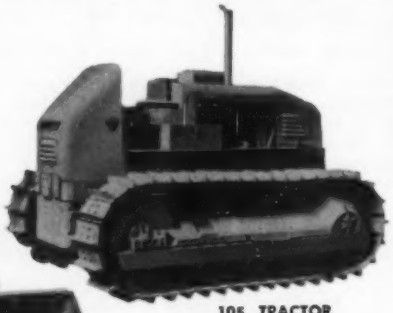
630 TRACTOR-EXCAVATOR — Designed for trackless operation underground. Air or electric powered. Independent control of each track. Available with an assortment of attachments. Loading speed 600 to 800 tons per shift. Headroom 6'8". Width 5'8⅝". Length (bucket down) 9'4".

630 TRACTOR-HOPPER — Standard 630 Tractor-Excavator fitted with an integral hopper at the rear of the Excavator. Used where short hauls are required or bulk material is to be moved to a hopper at floor level. Hopper can easily be adjusted for automatic opening and closing. Weight complete 12,000 lbs. Hopper capacity 32 cu. ft. Overall length (bucket down) 10'6". Hopper width 4'6½". Overall operating width 5'8⅜".

630 TRACTOR-DOZER — Air or A. C. Electric powered tractor with special straight blade dozer attachment. Dozer blades are equipped with screw type blade pitch and tilt adjustment and replaceable cutting edges. Track oscillation does not effect blade position and blade movement is by positive gear drive. Overall height 45". Overall width 62". Overall length 91⅝". Weight complete 7,980 lbs.

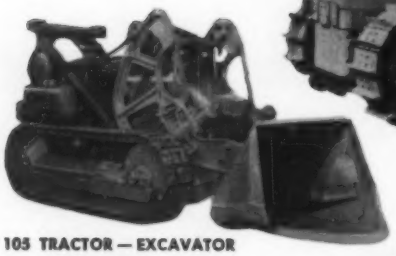
630 TRACTOR-DRILL — Standard 630 Tractor that can be fitted with a variety of drilling attachments. All parts are of heavy-duty alloy cast steel. Highly maneuverable, with independent control of each track. Tractor dimentions (without attachments). Overall height 45". Overall length 71⅞". Overall width 55". Weight complete 6,500 lbs. Drawbar pull at zero track slippage 10,600 lbs.

EIMCO 105 TRACTOR SERIES



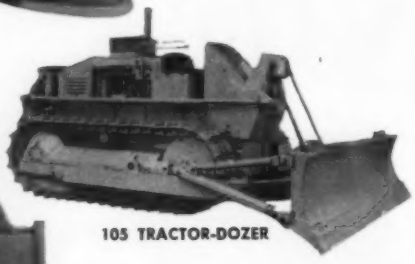
105 TRACTOR

105 TRACTOR — 125 or 143 HP diesel powered prime mover — available with bulldozer, loader and other attachments. Front and rear power take-off's. Independent control of each track. Exclusive Unidrive transmission which eliminates all manually operated clutches. Up front operator position for full visibility. Dimensions: Height 9'5¾". Length (base)12'6". Track gauge 74". Weight 28,000 lbs. Maximum drawbar pull with sufficient weight 55,000 lbs.



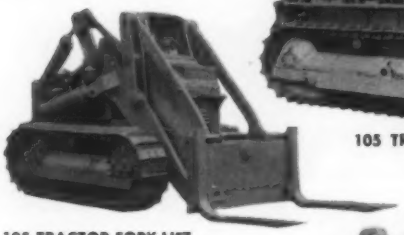
105 TRACTOR — EXCAVATOR (OVERHEAD)

105 TRACTOR-EXCAVATOR — 105 Tractor with overhead loader attachment. Designed for heavy-duty loading and excavating work of all types. Loading speed 6 to 8 cu. yds. per min. Headroom (std.) 13'2". Length (bucket down) (std.) 15'0". Track gauge 74". Weight 38,500 lbs.



105 TRACTOR-DOZER

105 TRACTOR-DOZER — Standard 105 Tractor equipped with either a straight blade (10'4" width) or an angle blade (13'0" width) attachment. Available with hydraulic blade control, single or double drum cable control, or a combination of hydraulic and cable controls. Other attachments or accessory equipment with standard S.A.E. drilling are easily mounted at front or rear power take-off's.



105 TRACTOR-FORK LIFT

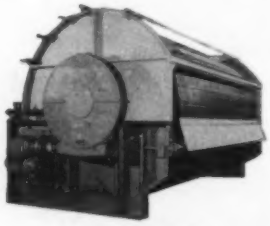
105 TRACTOR-FORK LIFT — 105 Tractor mounted with heavy-duty front end fork lift attachment. Rugged construction throughout. Oversize lift and tilt cylinders with built-in shock and relief valves for both directions of operations. Low hydraulic working pressure (650 psi). Hardened pins and bushings at all joints. Capacity at carry position 20,000 lbs. Capacity at full lift 15,000 lbs. Fork height (full lift) 14'6¼". Overall length (fork down) 19'9½". Weight complete 44,000 lbs. Hydraulically actuated tilting adjustment, keeps fork attachment on horizontal plane when loading in rough uneven areas.

105 TRACTOR-FRONT END LOADER

105 TRACTOR-FRONT END LOADER — Standard 105 Tractor mounted with an extra heavy-duty loader attachment. Total length (bucket down) 17'4". Bucket capacity 2½ cu. yds. Bucket height (full lift) 14'6¼". Maximum breakout force 40,000 lbs. Maximum lifting capacity at cutting edge 25,000 lbs. Capacity at carry position 20,000 lbs. Capacity at full lift 15,000 lbs. Average bucket cycle, raise-dump-return 15 sec. Weight complete 44,000 lbs.

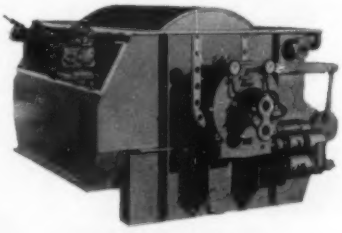
EIMCO FILTERS

DRUM FILTER — Features individual design. Provides deep drainage sections, greater piping area and large streamlined valves. Construction materials vary with material filtered and local operating conditions. Face length 2'0" to 18'0". Drum diam. 4'0" to 12'0". Other sizes made to specifications.



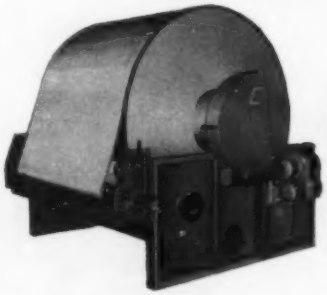
DRUM FILTER

PRECOAT FILTERS — Available for open, vapor and pressure tight requirements. Can be converted from open to vapor or pressure tight units in the field without changing existing units. Materials to specifications. Face length 2'0" to 16'0". Drum diam. 4'0" to 8'0".



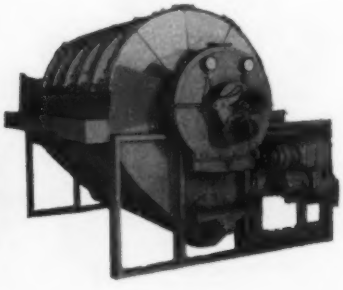
PRECOAT FILTER

ROTOBELT — Drum type filter designed with a cloth or woven stainless steel filter medium, in belt form. Medium edges are sealed for absolute minimum vacuum requirements in cfm per sq. ft. area. Belt Cycle; 1 - belt leaves drum. 2 - passes on to cake discharge roller. 3 - through washing compartment (filter medium is completely washed each revolution). 4 - onto return rollers. 5 - return to drum. Face Length 1'0" to 14'0". Drum Diameter 0'18" to 14'0".



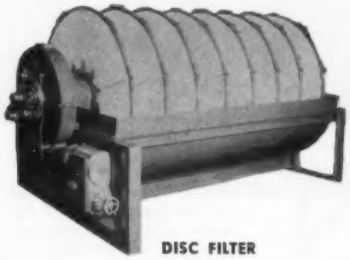
ROTOBELT

AGIDISC FILTERS — Designed for a comparatively wide range of particles in suspension, where the density of feed is lower and settling is rapid. Construction materials for filter and disc sectors vary with materials filtered and local operating conditions. Number of discs 1 to 12. Disc diam. 4'0" to 12'6". Other sizes made to specifications.

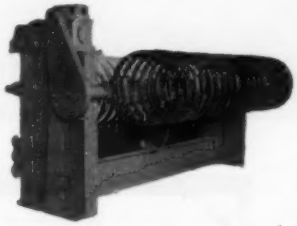


AGIDISC FILTER

EIMCO FILTERS



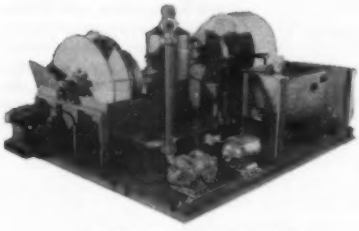
DISC FILTER



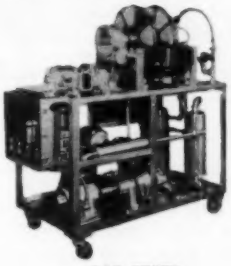
EIMCO-BURWELL FILTER

DISC FILTERS — Designed according to slurry characteristics. Construction materials for filter and disc sectors vary with materials filtered and local operating conditions. Number of disks 1 to 12. Disc diam. 4'0" to 12'6". Other sizes made to specifications.

EIMCO-BURWELL FILTERS — Designed with two sets of circular frames, each pair mounted at 180° of each other on a common shaft. One frame is always ready for operating. While the other is extended in cleaning position Number of frames 2 to 30. Frame thickness sizes 1", 1½", 2½", and 3".



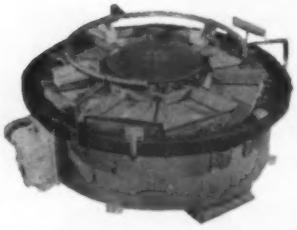
PLATFORM FILTER STATION



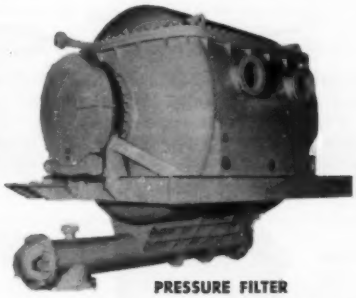
LAB FILTER

PLATFORM FILTER STATIONS — Constructed on a structral steel subbase and available with drum, disc, pan, pressure, or plate and frame units for pilot plant or small filter stations. Auxiliary equipment: receivers, vacuum and filtrate pumps, blower, motors, piping and central control panel.

LAB FILTERS — Drum or disc units specially constructed on a flat platform or in a cabinet, which includes all necessary operating equipment for a pilot plant or laboratory filter station. Construction materials to specifications.



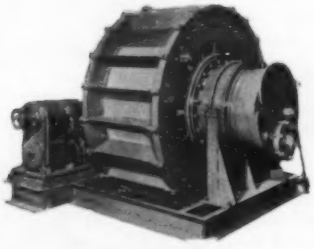
PAN FILTER



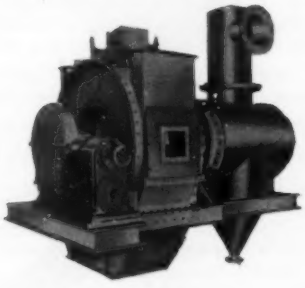
PRESSURE FILTER

PAN FILTER — Particularly suited to sluries having 10% or more solids consentration with medium to fast setting and a wide range of screen sizes. Independent compartments allow extremely sharp liquor separation between washes. Complete cake discharge is obtained by tilting pan compartments 160°. Sq. ft.of filter area available 10 to 240 and larger.

PRESSURE FILTER — Available with drum or disc unit inside a pressure vessel. Designed for pressure up to 150 P. S. I. and to A.S.M.E. code. Construction materials to specification. Maximum diam. 8'0" for std. drum, disc, agidisc and precoats. Dryers, max. 6'0". Cake discharge is by sealed screw conveyors or pressure tank.



DEWATERER



DRYER

DEWATERERS — Designed and especially adapted for high capacity dewatering of the slurrys with fast settling solids. Construction materials vary with material to be dewatered and installation specifications. Face length 3'0" to 6'0". Drum diam. 1'0" to 5'0". Other sizes to specifications.

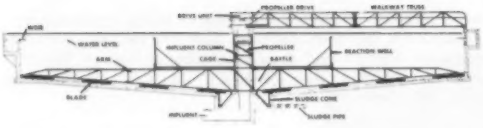
DRYERS — Designed and particularly suited for granular or crystalline materials which are fast settling in solution. Streamlined head assembly to direct heated airflow through cake and receiver. Face length 3'0" to 6'0". Drum diam. 1'0" to 5'0".

RESEARCH AND DEVELOPMENT CENTER

To further the science of Solids-Liquid separation through filtration, The Eimco Corporation established its Filtration Research and Development Center at Palatine, Illinios. These new, modern, completely equipped facilities are staffed by engineers internationally recognized as research and development authorities in the field of Solids-Liquid separation. Eimco's years of practical experience combined with the scientific findings of the Research and Development Center engineers give practical and logical solutions to all the processing industries, where filtration is an integral part of their flow sheet.

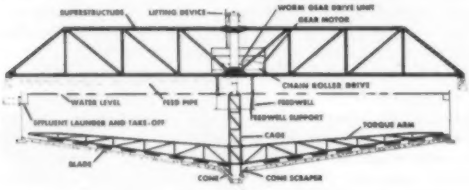
FILTER MEDIA — The snythetic and natural fabric available through Eimco are the most modern materials developed for filtration equipment in the Chemical and Processing Industries. Eimco's skilled filtration engineers will help you find the best filter medium to meet your specific filtration problems.

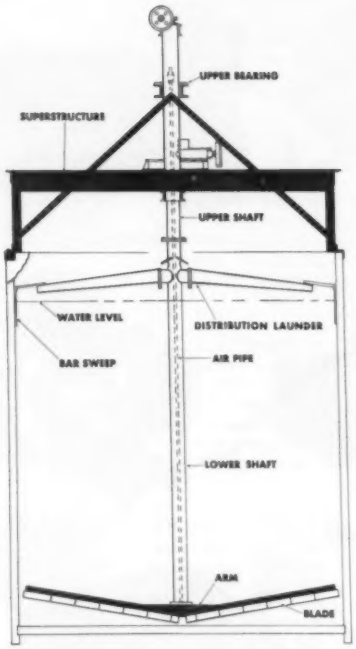
EIMCO — PROCESS EQUIPMENT



REACTOR-CLARIFIER— Eimco Process Reactor - Clarifier mechanisms are designed with mechanical or air agitation, flocculation or sludge recirculation in the center supplied in diameters up to 125 feet, are the most reliable and economical units available for water treatment, waste treatment and special flocculation - clarification services. Specific recommendations as to the size, type and materials of construction are made for each service.

THICKENERS— Eimco Process Thickener Mechanisms are available in sizes up to 325 feet diameter. Superstructure supported, center column and traction machines are made in wood, steel, rubber covered or stainless steel construction. Each mechanism is tailored for the required duty with balanced torque designed into every component to insure dependable trouble-free service on all pulps including the heaviest, fastest settling concentrates.





AGITATORS— Eimco Process Air Lift and Mechanical Agitators are supplied for tank diameters up to 40 feet. Every machine has the same rugged construction but all specific features such as the materials of construction, air requirements, air distribution, impeller type and size and rotative speed are designed specifically for the job after a thorough analysis of the operating conditions.

OTHER EIMCO EQUIPMENT

AIR MOTORS — Eimco Air Motors are five cylinder radial type motors for reversible or non-reversible service. Heavy-duty construction with special attention to streamlined air passages make the Eimco the most efficient air motor on the market.

GEARED AIR MOTORS — Eimco Air Motors are five cylinder radial type. Either flange or pedestal mounted and in a variety of gear reductions with a full range of speed reduction units. Precision made. Reversible. High starting torque. Dynamatic and static balancing for highest efficiencies and smooth operation.

AIR HOSE — Eimco Air Hose—extremely flexible wire braid. Neoprene tube that will not collapse. Natural rubber cover treated for resistance to abrasion and impact. Will not sun check. Available in sizes of ½" to 4" with or without connections.

LINERS — Utaloy Ball, Rod and Tube mill liners. An alloy cast steel, representing the ultimate in controlled microstructure. Actual job data shows that "Utaloy"liners will grind more tons per set.

BALL MILLS — Eimco cylindrical type ball and rod mills with either central overflow or grate discharge are available in a wide variety of sizes. Any Eimco mill can be converted from central overflow to grate discharge or vise-versa. Extra heavy-duty construction.

FOLDING SCRAPERS — Eimco Folding Scrapers are heavy-duty high capacity scrapers. Folding feature makes scraper require less power on return pull and dig in for full load on every trip. Cast of abrasion and impact resisting alloy steel.

AIR MOTORS

GEARED AIR MOTORS

AIR HOSE

LINERS

BALL MILLS

FOLDING SCRAPERS

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N. Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Pittsburgh, Pa. Seattle, Wash.
Cleveland, Ohio Houston, Tex. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

BULLETIN AP - 19, 3-58-50M Printed in U. S. A.

WEMCO ... WKE

EQUIPMENT

for metallic and non-metallic mining, chemical and process industries

SERVICES

engineers and builders for mineral, chemical and process industries

WEMCO SPIRAL CLASSIFIERS . . . *classifying, desliming, dewatering*

For wet mechanical classification of ores and industrial minerals in closed circuit grinding and open circuit applications. Slime-sand separations from 28 to 325 mesh. Single, double or triple spirals; tank options from straight side to full flare for desired settling area. Hydraulic lifting device available for starting under load without tank drainage. Sealed bearings, replaceable wearing shoes, continuous tube shaft assure long life.

Available also in design adaptations for sand preparation, coal dewatering.

SPIRAL DIAMETER: *12" to 90"*
TANK LENGTH: *6' to 48'*
RAKING CAPACITY: *5 to 24,000 TPD*
WEARING PARTS: *Alloy iron, stainless steel, or rubber covered*

WEMCO FAGERGREN FLOTATION MACHINES: *roughing, scavenging, cleaning*

World's largest installations use WEMCO-Fagergrens, proved in competitive tests to have unequalled capacity per cubic foot of cell volume per square foot of floor space. Rotor-stator principle promotes optimum pulp circulation and aeration for high metallurgical efficiency. New air control gives increased cleaning efficiency.

Pulp transfer accomplished by special feed boxes, eliminating much troublesome and expensive pumping. Cells are simplest to operate, with minimum of adjustments.

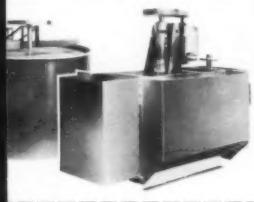
SIZE: *12" to 66"*
CAPACITY: *1 to 50,000 TPD*
ROTOR-STATOR: *Rubber or neoprene covered, stainless, or alloy iron*
TANK: *Steel, wood, stainless, cement or rubber lined*

WEMCO ATTRITION MACHINES . . . *scouring, scrubbing*

Designed to produce an efficient inter-particle impingement in dense pulps of 65% to 80% solids, for scouring pulp grains, removing organic coatings or previously used reagents, breaking up and removing clay and slime inclusions. Reverse propeller blade action produces ultimate in pulp mixing with minimum contact time.

Bearings, housing, other parts interchangeable with Wemco-Fagergren Machines. Wemco Agitator-Conditioners, certain Wemco Vertical Pumps.

CELL SIZES: *10 or 20 cu. ft.*
WEARING PARTS: *Alloy iron, stainless, rubber or neoprene covered*
CAPACITY: *5 to 100 TPH*



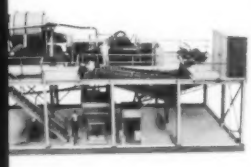
WEMCO AGITATOR-CONDITIONERS . . . *agitating, mixing, blending*

Fast, homogeneous mixing and steady, uniform feed to the next step in ore processing. Propeller type (left) for conditioning flotation pulp, reagent mixing or blending, dissolving of solids and liquids, and scrubbing applications. High intensity Fagergren type mixer-blender for reagents, other material with poor solubility characteristics.

Various parts interchangeable with Wemco-Fagergren Machines.

Turbine type agitators also available for special applications.

SIZES: *Propeller type, tank sizes from 2' to 20' diameter*
High-intensity type, cell sizes 2 cu. ft. to 100 cu. ft.
WEARING PARTS: *Alloy iron, stainless, rubber or neoprene covered*



WEMCO MOBIL-MILLS . . . *greatest efficiency in HMS*

Pre-engineered and pre-fabricated from standardized Wemco designs for maximum efficiency and flexibility in Heavy Media Separation. Mobil-Mills are used to produce marketable concentrates and for low cost elimination of waste in treating metallic minerals, industrial minerals, coal and industrial gems.

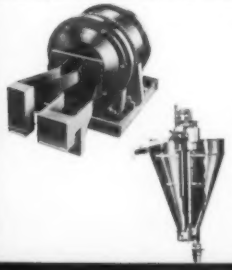
Wemco's long experience is your assurance of efficient design, producing by far the lowest cost per ton treated. Wemco Mobil-Mills are flexible in design, using either drum or cone separators as required; can be dismantled and moved if required.

SPECIFIC GRAVITY RANGE: *1.25 to 3.40*
CAPACITY: *5 to 500 TPH*
SEPARATORY VESSEL: *Cone, Single Drum, Double Drum, 2-Compartment Drum*

WEMCO DENSIFIERS . . . *dewatering and stabilizing HMS media*

One of many reasons for fine performance of the Mobil-Mill is use of a densifier, which provides a constantly available storage of thickened, conditioned and stabilized HMS medium. The Densifier acts as a buffer in preventing over-correction of separation gravities; eliminates need for complex automatic controls.

TYPE: *Straight tank, flared tank*
SPIRAL DIAMETER: *12" to 66"*
TANK LENGTH: *9' to 35'*
LIFTING DEVICE: *Manual or motorized*



WEMCO SEPARATORS . . . *clean HMS separation with drum or cone*

DRUM TYPE — Clean gravity separation in particle sizes from ¼" to 10". Float material overflows; sink material is raised by lifters which are an integral part of drum. No internal moving parts to wear or cause shutdown. 2-Compartment Drums produce a true sink, true float and middling. Double drums make two separations.

CONE TYPE — For extremely sharp separations, 10 mesh to approximately 4 inch. Large pool area minimizes small particle entrapment. Float material overflows; sink material removed by means of airlift from bottom. Furnished complete with stirring mechanism, airlift assemblies, drain plugs and fittings, feed and medium return hoppers, discharge launder.

SIZE:
Drum: 4' x 4' to 12' x 12'
Cone: 3' diameter to 20' diameter

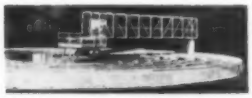
CAPACITY:
Drum: 5 to 450 TPH
Cone: 2 to 600 TPH

WEMCO **REMER JIGS . . . *close gravity separation of large tonnages***

Ideal for treating large tonnages of ores where specific gravity differential exists. Separates 3 products: high gravity fine, high gravity coarse, and light gravity material.

Differential Acceleration (combined high and low frequency strokes) provides live jig bed over entire surface, maximum hutching capacity for recovery of high gravity fines, complete stratification and separation in coarse bed products. Patented WEMCO-Remer system uses roughing, scavenging, cleaning circuits.

TYPE: *Two hutch, three hu*
SIZE: *5' x 11' to 5' x*
CAPACITY: *30 TPH to 60 TPH per*



WEMCO **HYDROSEPARATORS-THICKENERS . . . *desliming, thickening, clarifying***

Hydroseparators: Economical desliming - dewatering in minus 200 mesh range. Closely controlled agitator frees sand, adequate weir length reduces velocity preventing loss of desirable sands in overflow.

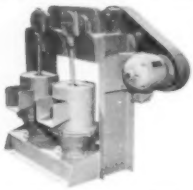
Thickeners: Produce a dense pulp for further treatment or recover process water solutions in flotation, leaching, cyanidation, and HMS flow sheets. Used in preparing feeds for flotation machines, filters, dryers, kilns, conditioners, magnetic separators, repulpers in counter-current decantation.

TYPE: *Beam, truss, center p*
SIZE: *Hydroseparators, 6' to 70' diame*
Thickeners 6' to 350' diame
LIFTING DEVICES: *Manual or motori*
CONSTRUCTI
Standard or acid-proof as requi

WEMCO **TORQUE FLOW SOLIDS PUMP . . . *unique, clog-free operation***

Unique design permits handling a large percentage of solids with negligible degradation, at steady discharge pressures with minimum wear. Torque flow principle and open impeller design permits passage of large solids and tramp material without entrapment or clogging.

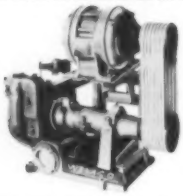
SIZE: *2" x 2" and 3" x*
to 8" x 8" and 10" x
CAPACITY: *50 GPM to 3000 GP*
HEAD: *Up to 100 f*
CONSTRUCTI
Ni hard for abrasive serv



WEMCO **DIAPHRAGM PUMP . . . *efficient operation, simplified servicing***

Unmatched for handling dense pulps, sludges and other fluids containing solids which wear or clog other pumps. Ideal for controlling hydroseparator and thickener underflow. Adjustable speed and stroke. Engineered for fast takedown and replacement of parts subject to wear.

SIZE: *2" to 4" Simplex and Dup*
CAPACITY: *5 to 100 GP*
CONSTRUCTION: *Fine grained iron, rubb*
valve seats, stainless steel or rubb
covering available for certain du



WEMCO **SAND PUMPS . . . *reliable service in toughest jobs***

Universally used for pulps containing sands, abrasive solids, slimes, slurries and heavy media; for pumping mill tailings, flotation feed, concentrates and tailings, for HMS circuits, screen products and grinding mill discharge to classifiers. Operation is simple. Complete change of wearing parts can be made in minutes by unskilled labor with simple tools.

SIZE: *1¼" to*
CAPACITY: *20 GPM to 220 GP*
DISCHARGE HEAD: *Up to 100 f*
PULPS HANDLED: *Up to 65% soli*
particles up to 1". (2" size ave
able with rubber covering
all parts contacting pu

WEMCO **VERTICAL SAND PUMPS . . . *added flexibility***

Same exceptional performance characteristics as pumps above, but with added applications because of vertical design. Used for any vertical sump duty including clean-up. They can be mounted inside flotation concentrate launders for pumping concentrates.

SIZE: *1¼" to*
CAPACITY: *20 GPM to 500 GP*
PULPS HANDLED: *Up to 65% soli*
particles up to ¾". (Rubber coveri
available on 2" size where require

WKE **ENGINEERING, DESIGN, CONSTRUCTION**

In its W. K. E. Division, Western Machinery Company maintains an organization with facilities to render a complete service in preliminary investigations, engineering, designing, plant construction from simple storage facilities to complete process.

With more than 20 years' experience in the field of industrial raw materials processing, W. K. E. provides the specialized experience, sound technical background and high quality results essential to the design and construction of profitable plants.

WEMCO

K **WESTERN MACHINERY COMPANY**

E **WESTERN KNAPP ENGINEERING CO. (Division)**

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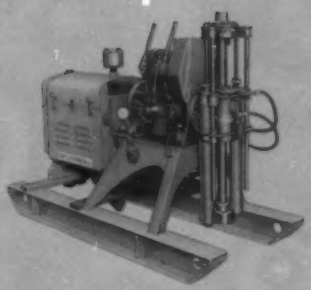
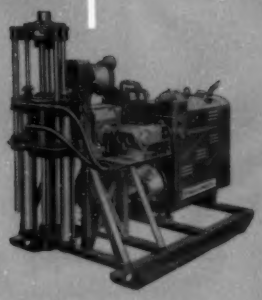
Bulletin No. G2-B2

MODERN . . . DEPENDABLE . . .
HIGH SPEED DRILLING MACHINES
AND LATEST ACCESSORY EQUIPMENT

YOUR COMPLETE DIAMOND CORE DRILLING - CENTER -

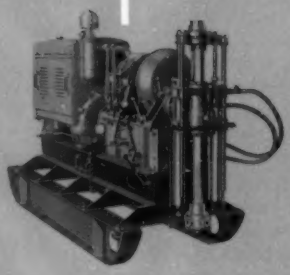


Sprague & Henwood Model 40-C Gasoline Engine Driven Core Drilling Machine, Low mount type, with double hydraulic swivelhead, oil operated with built-in circulating system. Bulletin # 185-1.

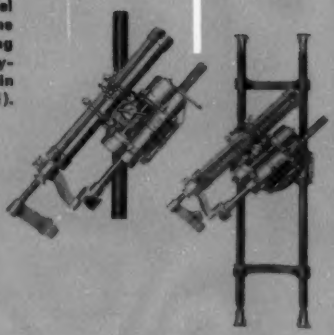


Sprague & Henwood Model 30 Water - Cooled Gasoline Engine Driven Core Drilling Machine with a double hydraulic swivelhead. Built-in water pump (optional). Bulletin # 350.

Sprague & Henwood Model 142 Gasoline Engine Driven Core Drilling Machine, with built-in oil circulating system and hydraulic swivelhead. Bulletin # 160



Model 325 and Model 550 Air operated machines for diamond core drilling underground. Driven by four cylinder radial-type air motors, both of these modern machines have ample capacity for fast steady operation.



ACCESSORY EQUIPMENT
A new and complete catalog No. 400 listing all accessory equipment is available. Write for your free copy today. It will be mailed promptly.

CONTRACT DIAMOND DRILLING...ANYWHERE
For over 70 years Sprague & Henwood has been the leader in the contract diamond drilling field. In that time, crews have completed thousands of contracts successfully, all over the world, in every conceivable condition.

For the best in exploratory core drilling (surface or underground), blast hole drilling, directional drilling, foundation test drilling, grout hole drilling, and pressure grouting—be sure to call Sprague & Henwood. Estimates and suggestions given without charge.

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Sprague & Henwood, in close co-operation with the United States Bureau of Mines, initiated the practice of "Orienting" drilling diamonds in their diamond bits. It was believed that by "Orienting" drilling bortz in their hard vector direction, that the "cost-per-foot drilled" should be substantially reduced.

Sprague & Henwood's contract drilling department has used over 30,000 "Oriented" diamond bits, and has supplied customers with thousands more. Proof that Sprague & Henwood "Oriented" diamond bits reduces the "cost-per-foot drilled" is explained and outlined in detail in Bulletin #320-1.

All Sprague & Henwood diamond bits are designed to do a specific job, and with information concerning your particular problem, Engineers will suggest and supply you with the Bit, Reaming shells and all accessory equipment necessary to give you the most for your drilling dollar.

Sprague & Henwood has developed four different types of matrices to be used if formation ranging from very soft, to extremely hard or highly abrasive stratas.

When you need diamond bits ... Call Sprague & Henwood in Scranton, the phone number to remember is DIamond 4-8507. You furnish the information on your conditions. They will supply you with the finest diamond drilling bits you can possibly buy anywhere.

IMPREGNATED CORING BIT
Especially suitable for drilling through hard, broken or extremely abrasive ground, where diamond loss from surface-set bits might be excessive. EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs when required.

DOUBLE-TUBE REAMING SHELL
Available in all standard sizes for use with all types of double-tube core barrels. Special sizes and types as required. Inserts are tough tungsten-alloy matrix set with carefully selected diamonds.

"M" SERIES "ORIENTED" DIAMOND CORING BIT
For use with "M" SERIES Core Barrel, when good cores must be secured from soft or friable strata. Available in all four types of matrix and three different grades of diamonds. Also in a complete range of impregnated sizes. EX, AX, BX and NX sizes carried in stock.

"ORIENTED" DIAMOND "TAPER" TYPE NON-CORING BIT
The fastest cutting bit for drilling blast holes in very hard formations. All standard sizes.

"ORIENTED" DIAMOND "PILOT" TYPE NON-CORING BIT
Recommended for drilling blast holes in hard formations and also for use when long straight holes must be drilled in variable formations.

"ORIENTED" DIAMOND "CONCAVE" TYPE NON-CORING BIT
Especially suitable for drilling round smooth holes in relatively soft formations, when cores are not required. All standard sizes available in four different types of matrix.

"ORIENTED" DIAMOND CASING-SHOE BIT
Available in the same wide range of sizes and types as the standard casing bits and designed so that they can be left on the end of the casing in the hole while drilling is continued through them with the corresponding standard size of core barrel and bit.

"ORIENTED" DIAMOND STANDARD CASING BIT
Available in all standard sizes with a choice of four different matrices and three different grades of selected diamonds. Larger sizes and special designs furnished as required. Must be removed before continuing to drill with core barrel and bit.

"ORIENTED" DIAMOND CORING BIT
Available in four different matrices and three different grades of correctly-sized diamonds. EX, AX, BX and NX sizes carried in stock. Larger sizes and special designs furnished to meet any specifications or requirements.

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Manufacturers of Vibrating Screens, Ore Concentrating and Material Washing Tables

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50 YEARS EXCLUSIVELY ENGAGED IN THE MANUFACTURE OF SEPARATING AND SIZING EQUIPMENT

SuperDuty® DIAGONAL-DECK® CONCENTRATING TABLES

New! **Models HCRD and HCCD provide doubling of discharge capacity for high gravity components of a table feed. (Patented)**

DIAGONAL-DECK Tables

DIAGONAL-DECK Deister-Overstrom Concentrating Tables have been accepted as the standard the world over for more than a quarter of a century. Leading this line of outstanding and time proven tables is the new *SuperDuty* DIAGONAL-DECK table, now firmly established by substantial commercial applications as the most advanced in features, performance and practical advantages.

THE *SuperDuty* TABLE

- OFFERS HIGHER CAPACITY—Small middling loads, a direct result of the DIAGONAL-DECK design, plus greater efficiency of CONCENCO® Head Motion means more tons of new feed handled per day per table.
- SURPASSES IN RECOVERY any other concentrating table built while maintaining comparable or higher feed and product capacity.
- MAKES HIGHER GRADE PRODUCTS because "fanning out" action of the DIAGONAL-DECK design permits more accurate cutting of product yield.
- YIELDS THE GREATEST PROFIT by its overall efficiency in performance and matchless operating economy.
- REQUIRES ONLY 2 H.P. Motor on the No. 6 Ore Table for starting and substantially ½ H.P. under continuous operation. The No. 7 Coal Washing Table requires only a 3 H.P. motor to start and substantially 1 H.P. under continuous operation.
- OFFERS A RECORD MAKING HEAD MOTION. The CONCENCO Anti-Friction Head Motion is a modern, efficient mechanism far ahead of the field. First in application of anti-friction bearings, its leadership has been maintained over two decades. Outstanding performance is fully verified through field-wide acceptance.
- IS THE SMOOTHEST AND EASIEST RUNNING table ever built, by virtue of its sturdy balanced supports, deck operating design and outstanding head motion.
- IS A COMPLETE MACHINE—embracing more than just a head motion, deck and a few slide bearing units requiring the addition of adequate frame and support elements to build into a finished and properly aligned machine that can be completed only at user's full responsibility and extra expense.
- CANNOT BE EQUALED FOR LOW COSTS in operation and maintenance.
- IS DEFINITELY OUT IN FRONT as your best, safest and most profitable choice considering both your investment and operating dollars.

SuperDuty DIAGONAL-DECK Ore Tables

Minerals—Metallic—For the recovery of mineral values from gangue, for the differential separation of complex minerals, DIAGONAL-DECK Deister-Overstrom Tables long proved their value. A logical development from these sturdy forerunners, the Super-Duty DIAGONAL-DECK Concentrating Table is today proving itself the most highly developed and successful wet gravity concentrating apparatus in the world's leading mills. Used ahead of flotation, these tables effectively eliminate barren coarse gangue and reduce the tonnage for fine grinding; relieve the pulp of a large part of the mineral load and lessen the burden on the more intricate flotation process. Following flotation, tables are used to recover the tarnished, oxidized or carbonate mineral particles that are so ineffectively recovered by flotation.

SuperDuty DIAGONAL-DECK Tables used as pilots in flotation guide the operator in regulating the flotation oils and reagents. Pilots are used on concentrates, middlings, intermediate products, tailings and are placed in various parts of the flow-sheet.

On carbonate or oxidized ores especially, these tables have proven the simplest and most economical method of concentration.

Minerals—Non-Metallic—The use of tables on non-metallic minerals is now general. For the separation of silica, feldspar, iron and granular particles from kaolin and in the recovery of mica, garnet, silica, cyanite, barytes, fluorspar, graphite, phosphate, potash, etc., tables have proven their commercial value. SuperDuty DIAGONAL-DECK Tables are used successfully on the most difficult separations; for example: the differential concentration of barite-iron-silica or garnet-silica-mica.

Recovery of Values from Residues—The residual sands and ashes resulting from operation of brass and other metal foundries have a high metallic content. Formerly this sand was washed by hand and an inefficient recovery made. SuperDuty tables are now used on foundry residue and efficient recovery is made of even the very finest metallics. Copper, brass, tungsten, zinc and many other metals are recovered from waste materials at a substantial profit.

WRITE FOR CATALOGS

Patents on equipment owned or controlled by The Deister Concentrator Co. Trade-marks registered in U.S. and foreign countries.

SuperDuty DIAGONAL-DECK Coal Washing Tables

The SuperDuty DIAGONAL-DECK Table cleans either bituminous or anthracite coal. Although most widely used on the sizes finer than ¾", installations on sizes up to 1½" are eminently successful. Conversely, because of ultra mobility and smoothness of deck operation, effective work is now possible on extremely fine sizes—within the minus 48 mesh range. Clean coal is being recovered in many instances from the refuse products of other coal cleaning devices, both with and without recrushing. Another source of table feed is the undersize from dewatering screens which follow other coal cleaning machines. Reject materials forming culm banks, river deposits and waste piles may in many instances be reclaimed. In fact, the SuperDuty table may be used on any cleaning problem where there is a specific gravity difference between relatively free particles of coal and refuse.

Design—*SuperDuty* DIAGONAL-DECK Coal Washing Tables are designed for efficient cleaning of coal, especially those sizes which jigs and similar machines fail to handle efficiently and profitably.

Installation—DIAGONAL-DECK Coal Washing Tables may be installed singly or in battery. Number of tables required is governed by tonnage to be handled. Tables in battery installation operate as independent units, consequently, individual tables may be cut in or out to meet variations in production schedule profitably.

Investment—*SuperDuty* DIAGONAL-DECK Coal Washing Tables represent the lowest initial investment regardless of size of installation. These tables meet the requirements for efficient cleaning, low operating costs and production flexibility.

Operation—This process, employing wet gravity principles, offers the greatest simplicity in operation, while full visibility of separation accounts for the finest results by unskilled attendants.

No other process can equal their performance on sizes 1¼" to finest dust. High efficiency is attested by their elimination of 90% or better of the free impurities including slate, sulphur, pyrite, shale, fire clay, gravel, bone and tramp iron. Simultaneously loss of coal to refuse is minimized beyond the possibilities of other processes.

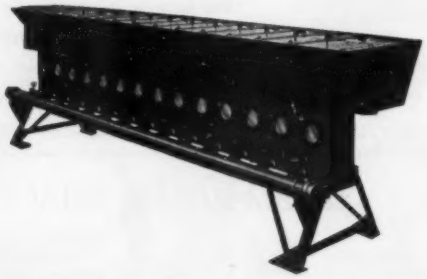
Capacities—Depending on type and size of coal, washability and cleaning requirements, capacities of DIAGONAL DECK Tables run from 4 to 20 tons per hour.

New Specialized Models—The new Models HCRD and HCCD are specialized designs of the No. 7 and No. 6 sizes, respectively, of the SuperDuty DIAGONAL-DECK Concentrating Table. In these models, that portion of the deck periphery available for discharging high gravity feed components is doubled, without subtracting from the low-gravity discharge periphery, thereby doubling available high-gravity discharge capacity, with attendant increase in table feed capacity. These models are intended for the high capacity handling of feeds wherein the high-gravity fraction represents a relatively large percentage of the total. Phosphate rock, coal and the ores of iron and chrome provide typical fields for application. For other feeds, wherein the high-gravity fraction represents a relatively small percentage of the total, the well known, regular models of SuperDuty DIAGONAL-DECK Concentrating Tables are applicable, as in the past.

CONCENCO® DISTRIBUTORS

The CONCENCO Revolving Feed Distributor, built in six types, is a heavily fabricated, all steel machine with motor drive requiring only ¾ H.P. in operation. The Distributor effects perfectly a splitting of feed sluiced to its revolving tank, into any desired number of equal portions from two to sixteen, in some cases more. It is especially suitable for efficiently feeding any number of circuits or machines in battery for higher overall efficiency. It is unexcelled for feeding concentrating tables.

CONCENCO® CPC Classifiers



CONCENCO Constriction Plate Classifiers of all steel welded construction are furnished in any number of cells from 2 to 14 to meet requirements. Each cell is square in horizontal cross section and consists of three chambers: the pressure chamber at the bottom; the sorting column immediately above and separated from the pressure chamber by a constriction plate; and the launder section above the sorting column, which is materially increased in cross section to reduce velocity of flow.

CONCENCO® *Super Sorter*

Giant High Tonnage Multiple Spigot Classifier

Patented

The CONCENCO SuperSorter does what engineering opinion has heretofore held impossible . . . it sorts granular materials hydraulically into a number of uniform, graded products on a low cost, high tonnage basis. The barriers of the past have been overcome in the CONCENCO giant classifier, which maintains teeter and zone densities hitherto considered impossible in large cell cross-sections needed for handling substantial capacities.

Applications

The CONCENCO SuperSorter meets that long-felt need for a multiple spigot, rising current classifier of sufficiently high capacity to handle economically coal, sand, iron ore, phosphate rock and similar granular minerals.

Capacities and Performance

The first battery of four 8-cell units installed has been in successful commercial operation for over eight years, classifying ¼" x 0" feed to a large battery of coal washing tables. Each SuperSorter unit handles in excess of 100 tons per hour, demonstrating phenomenal performance for both tonnage and efficiency. In the production of concrete sand, to the strictest engineering specifications, the SuperSorter has proved eminently successful. On minus 8 mesh sand, an 8-cell unit produces 130 tons per hour of accurately classified products.

Dimensions

The size and proportions of the CONCENCO SuperSorter may be quickly visualized from the following general data covering the 8-cell machine. The overall height, including 6" H-section supporting legs, is 14 feet. It is 6 feet wide and 40 feet long. Approximate weight, empty, is 16 tons.

Operation

A feature of the CONCENCO SuperSorter is the innovation for control of spigot discharge. Each classified spigot product is intermittently drawn off, with measured precision, from a quiescent bed at the bottom of the cell. High capaciy discharge of product is maintained with minimum water content and without disturbing the rising water currents or unbalancing classification in the sorting column immediately above. The novel constrictor valve mechanisms that control the draw-off from each cell are readily adjustable in operation over a wide operating range from open 90%, to closed during 100% of each cycle. The Constrictor valves permit a positively measured and uniform discharge rate from each cell—a condition essential to the high efficiency of the SuperSorter and to overall efficiency when operating in conjunction with concentrating tables or similar devices.

Water and Power Requirements

Water requirement is low for apparatus of this type. Hydraulic water is brought to the individual cells by means of a 12" header pipe and regulated with easily adjustable pinch valves. The only power required is for actuation of the tandem operated constrictor valve mechanism. A 1½ horsepower motor with gear reducer amply provides for even the largest multiple cell units. There being no other moving parts, operating costs are amazingly low.

Range

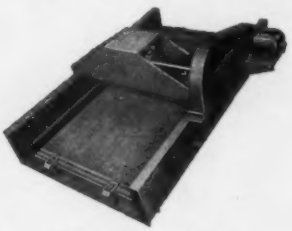
CONCENCO SuperSorters are now available in a range of sizes to meet the needs of any high tonnage classification problem. The individual cells are incorporated with a rectangular, partitioned tank provided with feed entry, adjustable overflow weirs and overflow exit. All construction is of heavy type.

The Leahy® SCREEN

Now Available with FlexElex Heating of the Jacket

Due to their rugged construction and mechanical simplicity, Leahy Vibrating screens far outdistance other devices in overall equipment life.

The heavy duty vibrator, doubly dust-proofed type and enclosed and forming an integral part of the structural steel bridge assembly, delivers a stronger and more positive vibration than ever before, superenergizing every square inch of screen jacket with the characteristic stratifying-screening-unblinding vibration, that is so highly acclaimed and profitably enjoyed by *Leahy* screen users. *Leahy* differential vibration guarantees open meshes, which in turn insure higher screening efficiency and capacity.



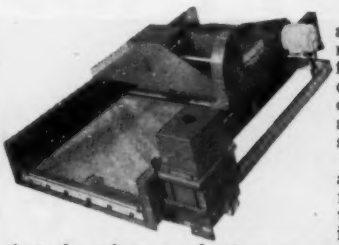
The Guaranteed Screen

Uses—For wet or dry screening from 3" opening down to fine mesh; also for dewatering and heavy media recovery. Unexcelled for screening at fine meshes.

Features—The new Leahy Screen has simplicity combined with proved ruggedness. Installation is inexpensive, with supports figured for dead load only, because no vibration goes into the screen frame or supports, and only ½ H.P. is used to operate. The heavy duty vibrator, running-in-oil at 265 r.p.m., produces 1200 to 2000 v.p.m. as needed. Maintenance is negligible—averaging less than 1% of first cost annually. Screen jacket economy is reflected in costs as low as $0.000574 per ton treated. The quickest jacket change feature offered in screening equipment combines with the use of reasonably priced stock jackets of woven wire and, with some models, perforated plates.

Types and Sizes—Open type, totally enclosed dustproof type; single or double surface; single vibrator; double vibrator; belt drive or motor drive in sizes: 17x32 in.; 2x4 ft.; 3x5 ft.; 3x6 ft.; 3x7 ft.; 4x5 ft.; 4x6 ft.; 4x7 ft.; 4x8 ft. Size designation indicates the overall dimensions of the screen jacket. *Special sizes built to order.*

FlexElex® Electric Heating of Wire Screen Cloth



The FlexElex heating arrangement is engineered especially for fine mesh screening of damp materials such as ores, fine coal, clays, shales, pulverized limestone, chemicals, etc.

A low voltage, high amperage electric current is passed through the screen cloth, causing it to heat sufficiently that the wires are kept warm and dry, to prevent any build-up of dust-size fines that contribute to blinding.

When the advantages of *FlexElex* heating are added to the Leahy unblinding action for disposing of intermediate size particles, the result is an efficiency and capacity never before achieved in the screening field. Screening at an accustomed mesh, capacity is stepped up to an astounding degree. On the other hand the same capacity may be maintained with smaller mesh openings formerly considered impractical.

DESCRIPTION. The *Flex-Elex* electric jacket heating system for the average size Leahy Screen comprises: a 15 KVA dry type single phase transformer with line voltage primary and low voltage secondary, complete with switches and controls for closer adjustment of current and heat used. Short, high capacity aluminum bus bars connecting transformer to contact bars at jacket eliminate flexible cables or connections in the heating circuit. Highest electrical and thermal efficiency is assured by the most practical design of circuit and heavy bus bars of generous cross section in laminated assembly with airgap spacing.

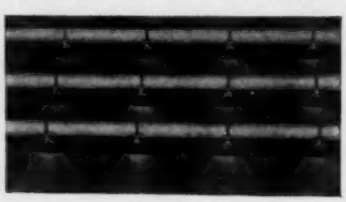
POWER REQUIRED for the average size screen amounts to only 9 or 10 KVA under normal temperature and moisture ranges. With the FlexElex system it is easy to regulate the current to meet day to day or season to season operating conditions with optimum results at minimum power consumption.

SCREEN JACKET CHANGE TIME. Screen jacket changes can be made with the same ease as with conventional type Leahy Screens. Furthermore, jackets need not be changed as often. Field experience shows that even with less expensive grades of cloth, the life of electrically heated jackets, requiring no beating or brushing, is several times that of unheated cloth.

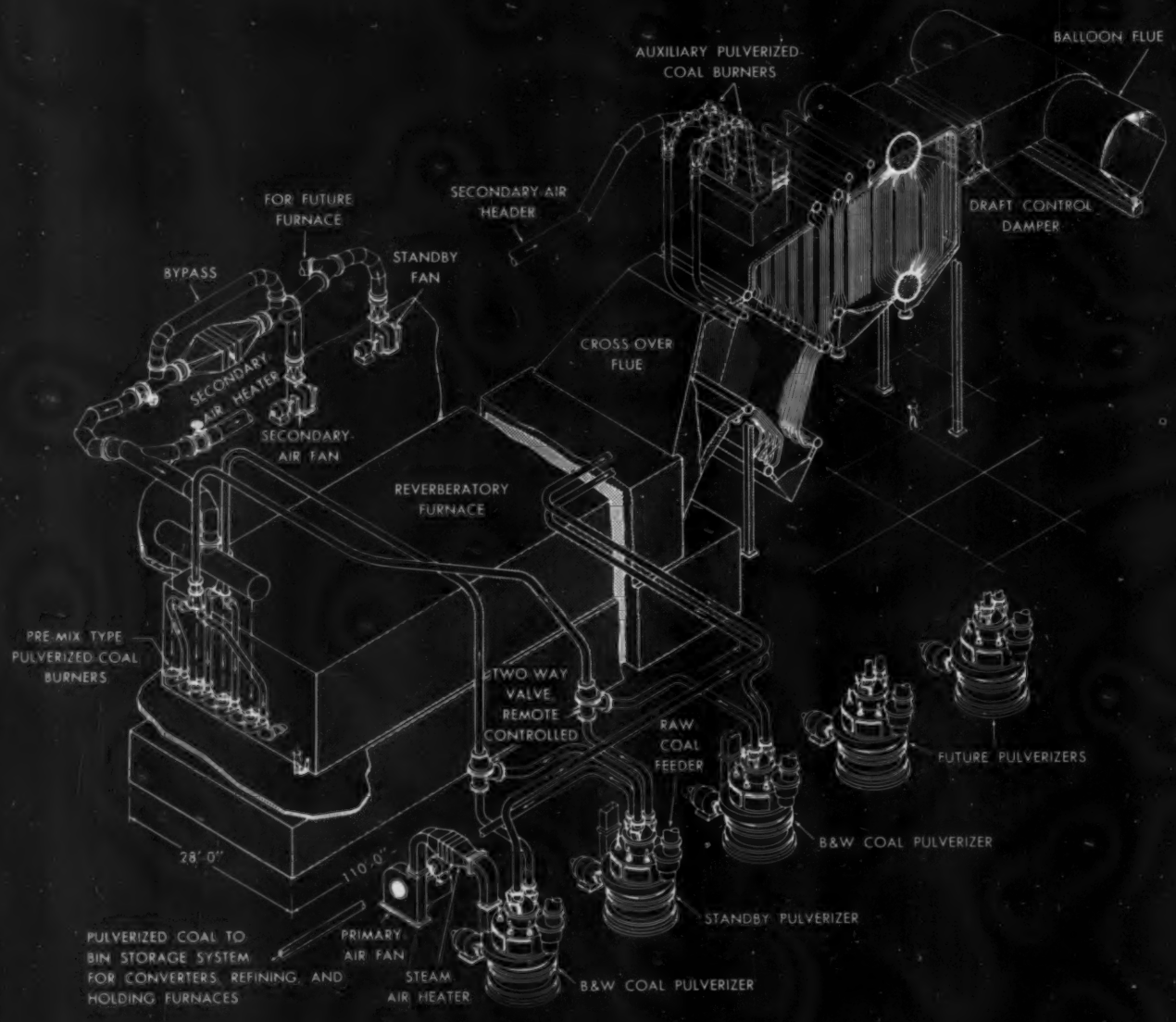
OVERALL ECONOMICS. Users say that the elimination of attendants for cleaning screen cloth, as well as materially reduced power consumption on the grinder (resulting from the accompanying reduction of circulating load, credited to increased screening efficiency of FlexElex equipped screens), generally more than offsets the cost of the equipment and power used to heat the screen cloth.

CONCENCO Spray Nozzle—Water Sprays

CONCENCO Spray Nozzles are unique and efficient. They are easy to apply. A hole is drilled in the pipe and the nozzle bolts on by means of a brass "U" bolt. No threading is necessary. The jet is a flat line spray very effective in washing or screening. The jets can be perfectly aligned one with another for sheet flow washing. The J-132 series with orifices of ⅛" to ⅜" fit 1" to 2" pipe. The J-136 series with orifices of 7/16" to ¾" fit 2" to 4" pipe.



How to Cut Processing



The White Pine Copper Company uses B&W coal-firing and waste-heat recovery system with B&W Single-Pass Boiler handling waste gases from the reverberatory furnace. B&W supplied all equipment shown with the exception of the reverberatory furnace and flues.

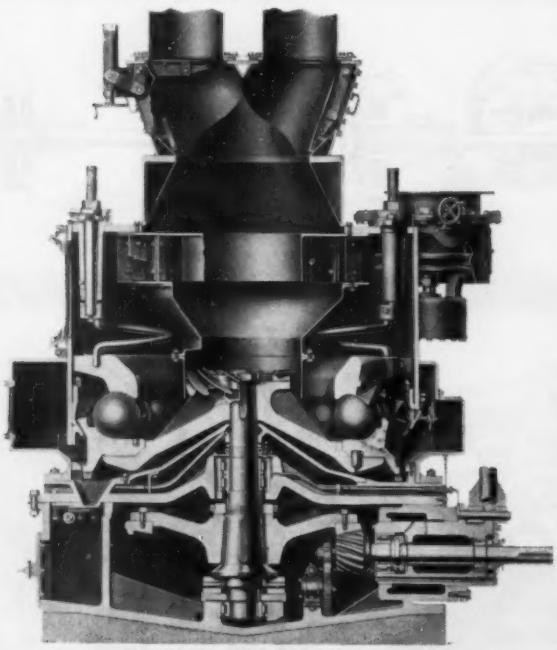
Costs in Metallurgical Plants

B&W Pulverized-Coal Firing Systems and Heat Recovery Units Help Do the Job

The White Pine Copper Company's fully integrated mine, mill and smelter in northern Michigan, started up in 1955, is one of the most advanced plants of its kind.

B&W had the responsibility of furnishing the complete raw coal handling, coal pulverizing and firing systems and the waste heat recovery equipment for this smelter.

The firing equipment is arranged with ample standby capacity to provide uninterrupted operation of the reverberatory furnace. During regular maintenance shut-downs of the furnace, continuous steam generation can be maintained by firing the boiler with the auxiliary coal burners.



B&W Type EL Pulverizer

Modern B&W boiler design permits uninterrupted furnace operation with a single boiler, eliminating the problems of a two-boiler arrangement with its costly cross-over flue design and refractory maintenance.

The B&W Single-Pass Boiler, under natural draft, easily handles dust-laden, high-temperature, corrosive gases from the reverberatory furnace. B&W's automatic soot-blowing system keeps the boiler clean and practically eliminates hand lancing.

B&W Direct-Firing and Circulating Pulverized-Coal systems are widely used for special firing applications of metallurgical furnaces. Higher production and lower operating costs can be attained through pulverized-coal firing. B&W's broad research, engineering, and production experience are available to solve your problems in metallurgical furnace-firing and waste-heat recuperation. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.

G-834-PC

BABCOCK & WILCOX

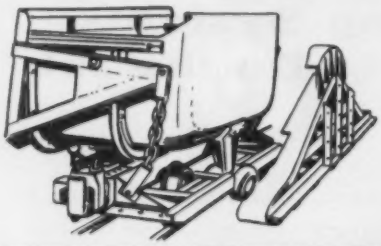
BOILER DIVISION

FOR YOUR PRODUCTION

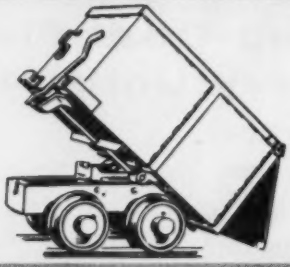
Our shops are known to mining men throughout the world for custom building of mine cars and other haulage equipment. Here are some of the standard and custom designed items made by Card. For complete information, write or phone.

Frequently modification of a standard Card car will serve to meet every specification of special haulage at very little more than the cost of a standard car. Our engineers can show you how to standardize your mine haulage with cars that are custom built for you alone. Many mine operators find they cannot afford even to make car

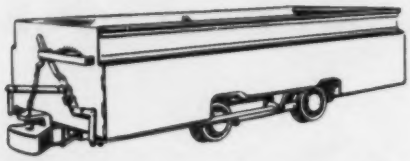
Granby Car with Dump Block



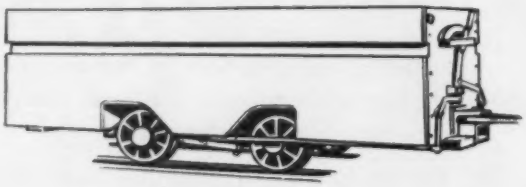
End Dump Turntable Type Z



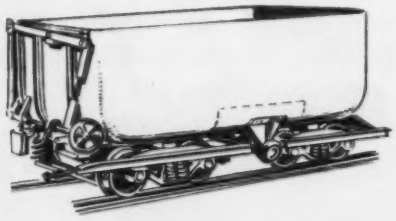
All-steel Rotary Dump Car



All-steel Rotary Dump Car



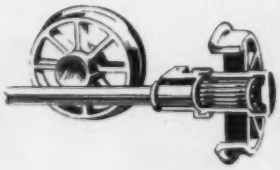
Large Capacity Granby Car with Mechanical Brakes



- Coal Mine Cars
- Ore and Industrial Cars
- Mine Car Wheels & Trucks
- Sheaves—Rope, Knuckle, Curve
- Track Rope Rollers, Slope Rollers
- Carrying Sheaves, Swivels, Hitchings
- Loading Booms, Landing Chairs
- Automatic and Plain Cages Skips and Dumps
- Revolving Screens
- Perforated Screen Plates
- Truckloaders
- Track Turnouts
- Frogs, Crossovers, Guard Rails
- Split Switches
- Switch Stands
- Track Turntables
- Rail Sections and Parts

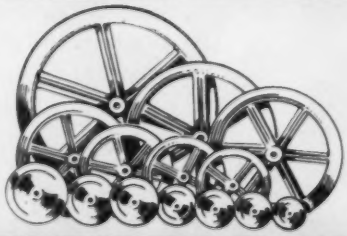
Bicycle Spoke Sheaves

Card Roller Bearing Truck



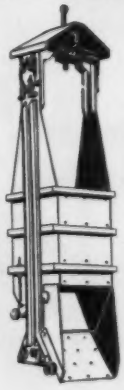
Card Timken Bearing Truck

Standard Rope Sheaves, Heavy Pattern

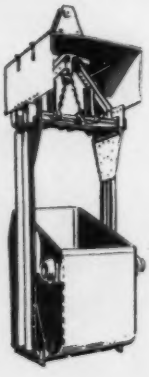


Card Automatic Skips

BOTTOM DUMP TYPE



KIMBERLEY TYPE



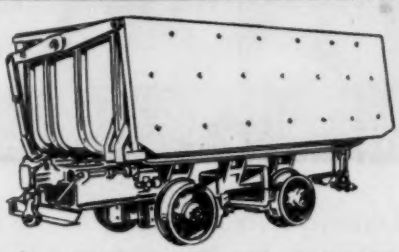
Be your production large or small, Card can fit your needs—economically. Our engineers are available for consultation on your haulage problem. No obligation.

HAULAGE Pick a winning Card!

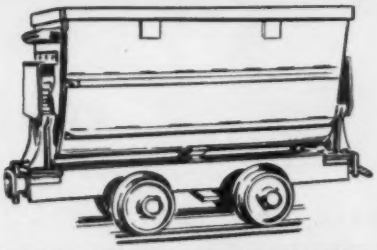
bodies and repair parts...Card prices are lower even after freight costs are added.

Note the partial list of customers below. Some are now replacing original orders after 10 - 20 years...with Cards, of course.

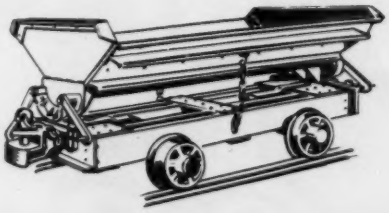
A Popular Granby-Type Car



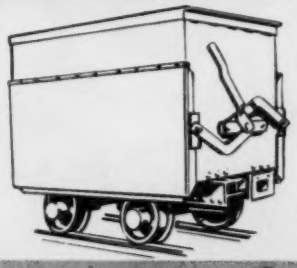
Rocker Dump Car



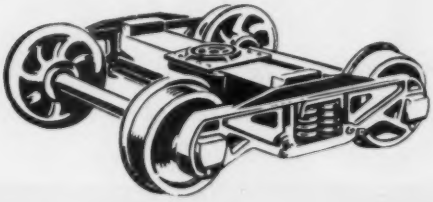
Rocker Dump Car, extra low



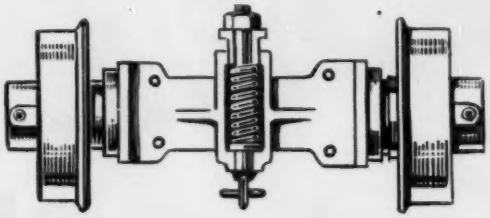
Gable Bottom Type Car



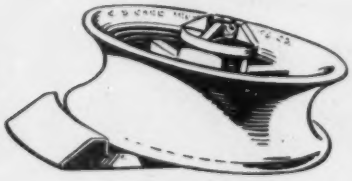
Spring Mounted Bolster Truck



Patented Spring Drawbar Truck

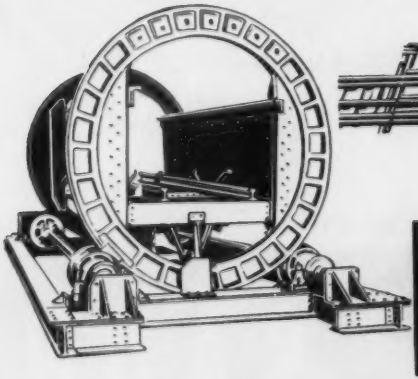


Card Curve Sheave



Roller Bearing Track Rope Roller

Card Power Driven Rotary Dump



Example of Card Track Equipment

CLIMAX MOLYBDENUM
INTERNATIONAL MINERALS
PHELPS DODGE
KENNECOTT COPPER
U. S. VANADIUM
U. S. POTASH
VERMONT COPPER
HOWE SOUND
CALERA MINING
HOMESTAKE
TELLURIDE MINES
IDARADO
CANANEA CONSOLIDATED COPPER CO.
ANACONDA
VICTOR CHEMICAL WORKS
CLEVELAND CLIFFS IRON
POTASH CO. OF AMERICA
CONSOLIDATED MINING & SMELTING CO. OF CANADA
AMERICAN SMELT. & REF.
UNITED STATES SMELT. REF. & MINING
UNION PACIFIC COAL
GENEVA COAL CO.
COLO. FUEL & IRON CORP.
INDEPENDENT COAL & COKE
COLO. & UTAH COAL
TUNGSTEN MINING
NEW JERSEY ZINC

C.S. Card Iron Works Co.
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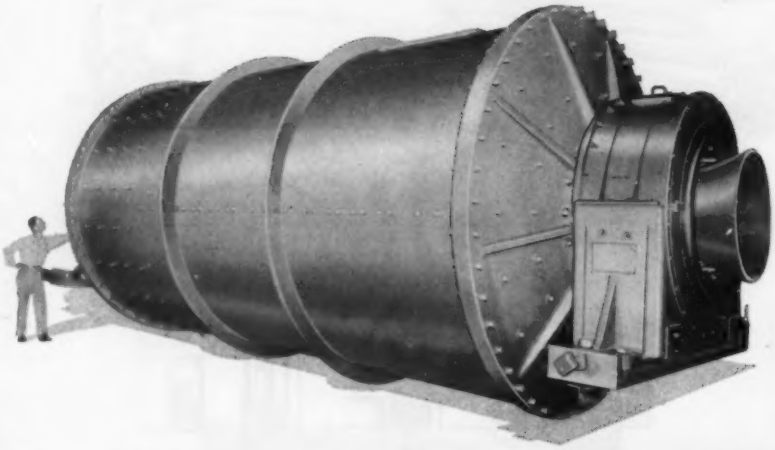
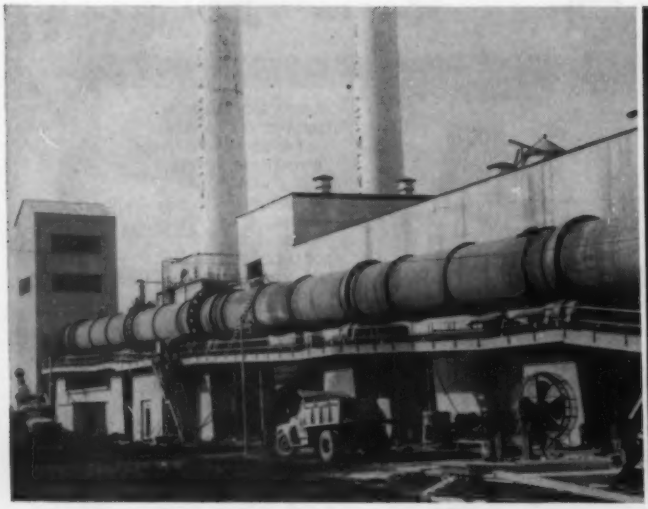
KENNEDY...

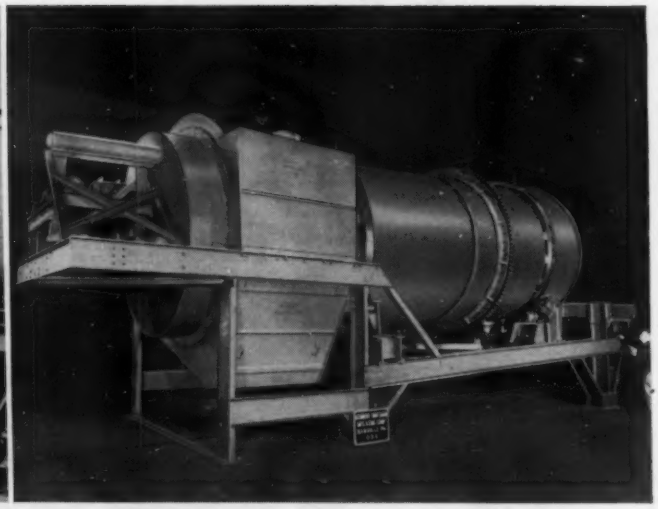
We manufacture everything from a crusher to a conveyor system. Complete KVS Mining Plants are in use throughout the world, engineered to meet specific requiremnts for handling all types of rock and ore. Consultations with KVS engineers can be arranged anywhere . . . any time!



BALL, ROD, TUBE MILLS
For grinding and pulverizing; wet or dry process—any dimensions or capacities.



ROTARY KILNS: Heavy Duty...Cement...Wet or Dry Process, Lime, Calcined Coke, Dead Burned Dolomite, Nodulizing and Agglomerating.



BALLING DRUM For pelletizing iron ore.

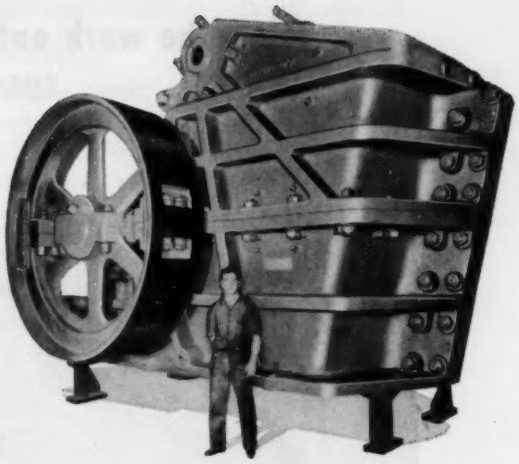
Send for Bulletin describing KVS Machinery and Equipment.

KENNEDY-VAN SAUN

Machinery and Equipment for the Mining Industry...

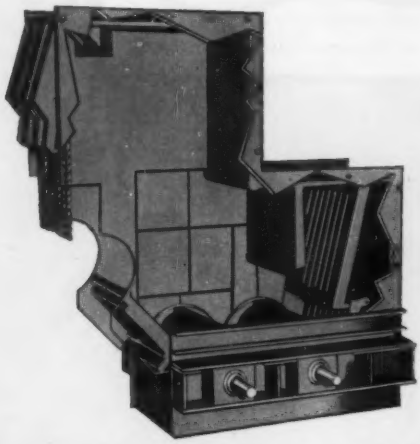
GEARLESS GYRATORY CRUSHERS

Primary and Secondary—Noted for efficiency in crushing. Wide range of sizes and capacities—V-Belt Drive or synchronous motor, built integral into pulley.



SWING JAW CRUSHER

Heavy Duty . . .Wide Range of Sizes. Jaw plates reversible. Frames of larger sizes built in four sections. Shaft cast integral with Swing Jaw. Automatic Lubrication System.



CUBER SENIOR IMPACT BREAKER

Multi-stage, regulated flow impact breaker for primary and secondary crushing. Dual rotor, triple action. Available in stationary or portable models.

KENNEDY PRODUCTS

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- Swing Jaw Crushers
- Tube Mills
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- Coolers, Dryers
- Preheaters, Deheaters
- Belts, Conveyors
- Pneumatic Transport Systems
- Waste Heat Boilers
- Pulverized Coal Firing Systems
- Steam Generators
- Asbestos Plants
- Complete Lime Plants
- Complete Cement Plants
- Complete Aggregate Processing Plants

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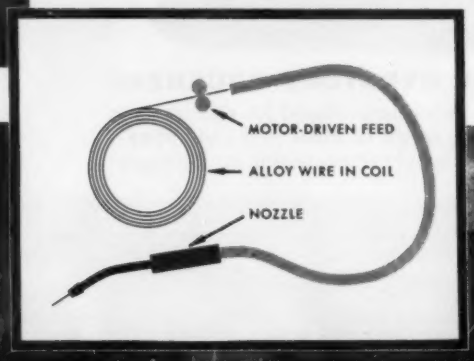
Semi-Automatic

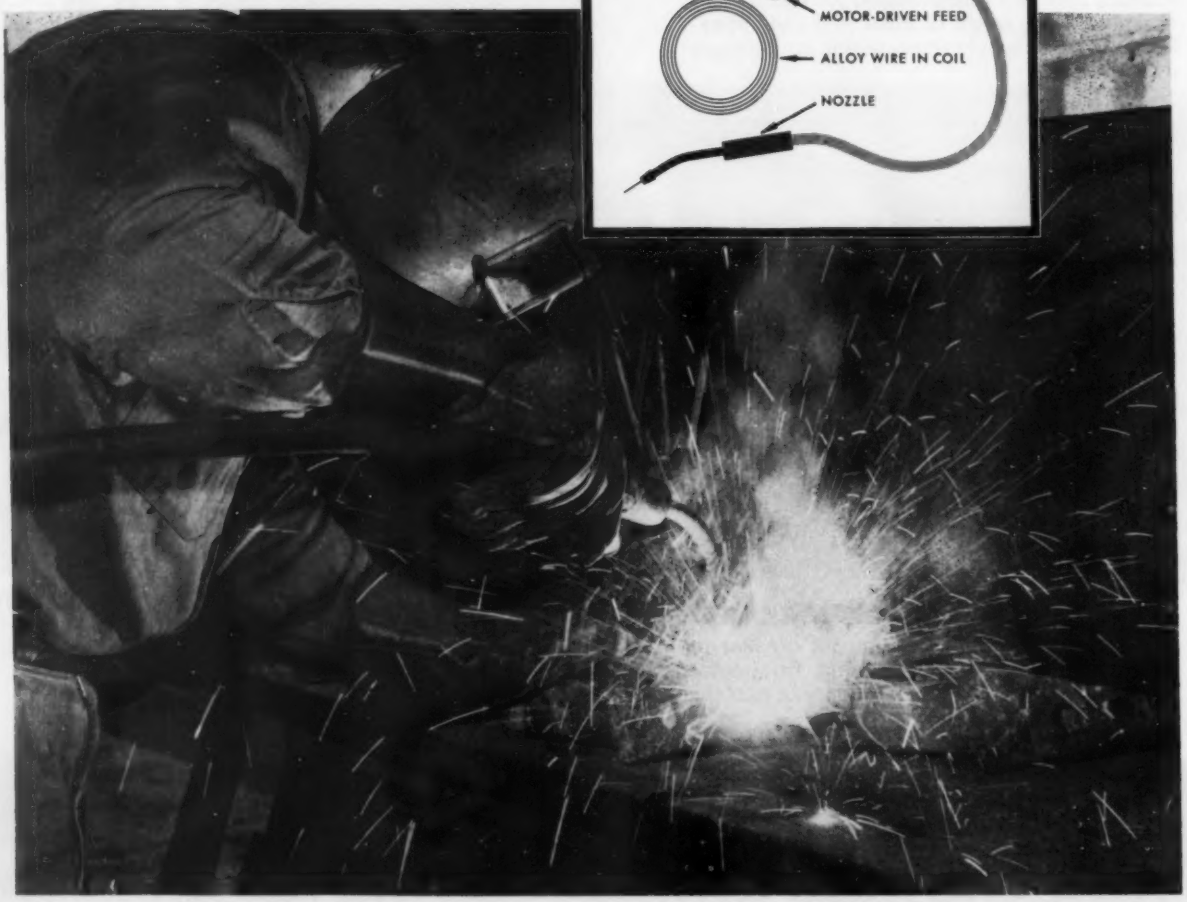
with STOODY WIRES

Takes the work out of welding — speeds application — cuts overall costs!

How Stoody Semi-Automatic Hard-Facing Works

Stoody Wires are supplied in layer-wound coils for use on any automatic welding machine, with minor conversions. The wire is mechanically fed to the nozzle by a motor-driven feed roll and idler roll which are actuated when the arc is struck. The welder thereafter merely directs location of the weld deposit, the machine feeding the wire automatically as the arc is struck, stopping when the arc is broken.





Hard-Facing

Semi-automatic hard-facing with Stoody Tubular Alloy Wires is one of the greatest labor-saving processes yet developed for the maintenance man! It hustles you through jobs at speeds 2 to 4 times faster than manual welding. Wires are bare, need no flux or flux dams. Deposits are thus fully visible during welding... easy to lay along an edge or to a mark.

With Stoody Wires you get *low penetration*, this means less dilution and, consequently, a higher alloy content in the final deposit. Wear resistance is thus improved... usually superior to manual electrodes of similar analysis.

Finish on the wire is clean and bright, free from burrs and slivers, insuring smooth feed through the machine. Because the wires are drawn through special sizing dies after being formed they are concentric, true to diameter and uniform throughout their length. Special chemically coated papers protect against rusting and the fibreboard shipping container insures all shipments arriving undamaged, ready for use.

When you load your first coil of Stoody Wire you'll find the nylon wrapping especially handy—no heavy wires or straps to remove, yet the wire stays coiled till you're ready to weld!

Remember, with Stoody you get a complete range of proven, time-tested wires, from low alloy to high alloy types, plus a tungsten carbide... all backed by 10 years use in the field!

Nickel Manganese and Stoody 121 Wires are available in 3/32" or 7/64" O.D. Other alloys in 7/64" diameter only. All Stoody Wires feed through most semi-automatic machines with only minor changes in wire guides, feed rolls and nozzle.

For more information see your nearest Stoody dealer, 600 of them, in all parts of the U.S. and Canada (check the Yellow Pages of your phone book) or write direct.

STOODY COMPANY

11969 East Slauson Avenue
Whittier, California

Stoody 100

Applications... Crusher rolls, impellers in impact type crushers, bucket teeth and lips, scarifiers and rippers, tool joints, cement mill pulverizer rings and loader lips

Stoody 100HC

Applications... Catalyst piping, Banbury mixers, crushers and parts subject to severe abrasion

Stoody 102 *(for submerged arc application only)*

Applications... Cable sheaves, small diameter shafting, shovel idlers and equipment subject to high compressive loads

Stoody 104

Applications... Designed primarily for build-up of carbon and low alloy steels

Stoody 107 *(for submerged arc application only)*

Applications... Crane wheels, house rollers, mine car wheels, tractor and shovel parts subjected to severe impact

Stoody 108

Applications... Sprockets, shovel idlers and pads

Stoody 121

Applications... Crusher rolls, impellers in impact type crushers, bucket teeth and lips, scarifiers and rippers, cement mill pulverizer rings, loader lips

Stoody 130

Applications... Earth boring and scraping operations on equipment such as tool joints, augers, conveyor flights, scraper blades, rippers and concrete mixer paddles

Stoody Nickel Manganese

Applications... Strength welding and rebuilding of manganese parts

GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION: 430 WHITEHEAD ROAD, TRENTON 4, N. J.

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EST. 1870

Goodall Rubber Company of Canada, Ltd., Toronto — *Distributors in Other Principal Cities.*

"MINE KING"

AIR HOSE

Sizes ½" to 1", I.D.

A Goodall "Standard of Quality" product, designed especially for mining service. Molded and braided construction, with extra strong duck carcass, oilproof tube and tough, wear-resistant cover that protects carcass from penetration of sulphurous mine water. Extremely flexible. Double and triple cord. Continuous lengths up to 500 feet.

"BROWN CORD"

AIR HOSE

Sizes ½" to 1", I.D.

A molded-and-braided hose for drilling, riveting, and other general pneumatic tool service. Tube, carcass and cover are combined to assure great strength and durability, without impairing flexibility and easy handling. Oilproof tube; rubber cover. Available in lengths up to 500 feet.

"SUBWAY" ®

AIR HOSE

Sizes ½" to 1¼", I.D.

Another Goodall "Standard of Quality" hose especially built for rock drilling and all other heavy-duty air tool work. Light weight, flexible, easy to handle. Tough, oilproof black rubber tube; highest quality wrapped duck carcass; wear- and weather-resistant red rubber cover. Maximum lengths of 50 feet.

"HARDROK" ®

WIRE BRAID AIR HOSE

A super-hose for rock drills in construction, quarrying, mining and any other heavy-duty air service. Longwearing, oilproof Synplastic tube; horizontally braided steel wire carcass; tough yellow rubber cover, with black spiral stripe for identification. Light in weight, extremely flexible. Sizes ½" to 2", inclusive; two and three braid.

"NEWTYPE"

SUCTION AND DISCHARGE

Patented wire-reinforced, woven cord construction gives "Newtype" unusual strength and durability for both suction and discharge. Light weight, extremely flexible. Cannot kink, buckle or collapse, yet if accidentally crushed, can be quickly rounded into shape again without harm. Smooth bore. Sizes 1" to 4", I.D. Max. lengths of 50 feet.

"INFERNO" ®

STEAM HOSE

Sizes ½" to 2½", I.D.

Built with multiple-layer wire braid carcass, heat-resistant tube and tough, abrasive-resistant red rubber cover. Wire braids will cause steam to be diffused from damaged hose, providing a safety factor against sudden burst. Extremely flexible. Recommended for pressure up to 200 lbs., and temperatures up to 400°F. Maximum lengths of 50 feet.

"76"

STEAM HOSE

Sizes ½" to 2½", I.D.

Combines all the quality characteristics required for long, safe performance under conditions involving pressures over 100 lbs., but not exceeding 150 lbs. Wrapped duck construction, with high-temperature tube and black wear-resistant cover. Maximum lengths of 50 feet.

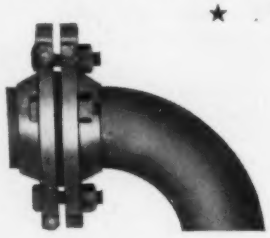
"BUCKSKIN"

WATER HOSE

Sizes ½" to 4", I.D.

Long famous for quality and reliability in every water hose service. Tube is of slow-aging rubber stock—tough and pliable. Strong rubber cover withstands roughest surface wear and abuse, and affords maximum protection to cotton duck carcass from contact with moisture. Maximum lengths of 50 feet.

★ ★ ★



"KEMITE" DUCT WITH "FLANG-LOK"

Floating Flanges

For mine suction and discharge. Tube offers highest resistance to abrasive wear. Wire-reinforced carcass will not kink or collapse. Cover is tough, long-wearing rubber compound. Generally furnished with "Flang-Lok" Ends, to accommodate "Flang-Lok" Flanges. Sizes up to 4", I.D.

"FLANG-LOK" FLANGES provide the most convenient and efficient method of connecting "Kemite" Duct, effecting a leakproof, rubber-to-rubber seal, and permitting full flow. For bolt alignment, flanges turn independently of the duct or pipe. No gaskets or washers. All sizes.

"GOODITE" FLEXIBLE PIPE. Same construction and advantages as "Kemite" Duct, above, but available in larger sizes—up to 12", I.D.

The GOODALL Trademark on hose, belting, boots and clothing for the Mining Industry represents a standard of quality and reliability established through sixty-seven years of manufacturing experience, backed by continuing research and development. Product specifications are based on first-hand knowledge of mine service requirements, with selected materials, expert craftsmanship and careful inspection assuring the utmost in on-the-job performance and economy.

GOODALL RUBBER COMPANY · R G ® · EST. 1870

CONVEYOR BELTING

"SUPER TRIPLE-S." Goodall's finest grade. Heavy duck carcass, high tensile rubber covers and strong friction between plies. Designed to carry run-o-mine coal, ores, slag and crushed limestone up to 10", wet or dry. Widths up to 48".

"TRIPLE-S." Same superior quality as "Super Triple-S," but of somewhat lighter construction. Widths up to 48".

"GOODALL." The *right* belt for the great number of lighter conveying jobs where the *extra* qualities of "Super Triple-S" and "Triple-S" are not required. For sized coal, crushed stone, gravel, shells, ashes, etc. Widths up to 48".

ELEVATOR BELTING

"SUPER TRIPLE-S," "TRIPLE-S" and "LA CROSSE" are long-established Goodall brands, built to specifications that assure reliable, economical service under conditions for which each is designed. "La Crosse" made in widths up to 30", others to 48". Available with extra features—punching, stitching, endless—if desired.

"POWER KING" TRANSMISSION BELTING

Friction surface, raw edge construction, especially built for most severe service. Minimum stretch and firm contact with pulleys at high speeds. Highest quality skin friction between plies. 35 oz. silver duck.

★ ★ ★

Other Goodall Products for the Mining Industry

"LONG-LIFE" PLASTIC PIPE—FLEXIBLE, RIGID, SEMI-RIGID

PUMP DIAPHRAGMS	**RUBBER SHEET PACKING**
PUMP VALVES	**RUBBER & DUCK PACKING**
PISTON PACKING	**CHUTE LINING**
ASBESTOS PACKING	**HOSE COUPLINGS, CLAMPS**

LIQUID CORROSION-RESISTANT LININGS

GOODALL WATERPROOF FOOTWEAR and CLOTHING

Famous for Quality, Comfort and Long Wear

"TOE-SAVER" ® BOOTS

Smooth, tough, flexible jet black rubber, heavy duck lined. Cushion insole. White cap over reinforced steel toe tested to withstand 2,000 lbs. pressure. Tire-tread soles. Hip, Style MB-346. Storm King, Style MB780. Short, Style MB945.

"WEAR KING" ® BOOTS—Identical in quality with above, but without "Toe-Saver." Hip, Style MB345. Storm King, Style MB799. Short, Style MB945.

"RUBBERHIDE" SAFETY INNERSOLES. Sheet of high-tensile spring steel bonded between layer of top grade sole leather and layer of rubberized canvas duck. Puncture-proof.

MINER'S PACS **Top quality black rubber Lace Pacs, Style ML-975, 16" high; Style ML-760, 15" high. Cushion insole. Cleated outsole. "Toe-Saver" Safety Toe. Also non-lace "Terra Haute" pacs, Style ML-271, in otherwise same construction. Other boots, workshoes, arctics and rubbers, built for extra wear and comfort.**

COATS, JACKETS, OVERALLS

Items too numerous to describe here, in rubber, oiled and latex . . . all designed to afford maximum protection plus comfort in every kind of work. Style 338 coat is a long-time favorite . . . double back; corduroy-lined collar; length 49".

SAFETY HATS

"Hardboiled" Safety Hats in fibre glass and aluminum. Easiest to wear, yet providing maximum protection. Also, miners' caps, with or without lamp brackets.

TUNNEL SUITS

Style 80 jacket with Style 81 Overall makes the ideal suit for underground work. Other suit combinations to meet every preference or need.

★ ★ ★

Write for catalog describing the complete Goodall clothing and footwear line.

At these TOUGH WEAR points, specify "THE TOUGHEST STEEL KNOWN"*

Sprockets
Amsco® Manganese Steel sprockets and replaceable rims, hardfaced with Amsco "Economy Hardface C", give 3 to 4 times the life of ordinary sprockets.

Rollers, Idlers
Automatic build-up, then hardfacing with Amsco AW-79 Rod, gives twice the wear of original parts, saves 50% on replacement.

Track Shoes
Manganese Steel construction, with grouser bar integrally cast, and holes counter-sunk so bolts can be re-used. For temporary repair, grouser bar is torch cut and welded to shoe.

End Bits
Corner inserts of Amsco Manganese Steel add extra service life to blade. Amsco HF-40 hardfacing further increases wear resistance.

Scraper Blades
Amsco Manganese Steel gives longer lasting "bite". Amsco HF-40 is ideal for hardfacing.

*AMSCO MANGANESE STEEL . . . plus AMSCO HARDFACING

Shown above are just a few of the "tough wear" points where Amsco products can save you money. Whether for original parts, or for build-up and hardfacing, specify Amsco Manganese Steel and Amsco Hardfacing for maximum operating economy.

We'll be glad to give you full information on Amsco Tractor Parts, Hardfacing Materials or Automatic Welding Machines. Just call your nearby Amsco representative, or write us direct.

OTHER AMSCO PRODUCTS

DIGGING: backhoe buckets—dippers and parts—repointers—dragline bucket parts—dragline chain—sheaves—pinions.

CRUSHING: concaves—mantles—jaw plates—mill liners—hammers.

HANDLING: truck bed liners—grizzly parts—car wheels and liners—sheaves, gears, pinions.

WELDING: automatic and semi-automatic welders—hardfacing rod—manganese plates and shapes.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division • Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS; JOLIETTE, QUEBEC

AMSCO TUBE ⊙ RODS

for semi-automatic HARDFACING

The perfect uniformity of Amsco Tube Rod insures smooth, trouble-free feed to the work. Note hardfacing alloy compactly enclosed within the steel tube.

Here are new, improved tube rods . . . *specially designed and engineered* for semi-automatic hardfacing! They have *proved* their speed, quality of weld and uniform deposit in actual use tests. In many cases, deposition rate has been increased up to 200% over other types of semi-automatic electrodes.

Amsco® Tube Rods are perfectly symmetrical, steel-shell wires, with the various alloys firmly enclosed and evenly distributed, for proper weld deposit. The steel shell is work-hardened to provide rods that will not deform or snarl during welding . . . that will run well in any semi-automatic welder. The rods are pre-lubricated, to insure constant and uninterrupted feeding to the work.

For additional information and technical data on Amsco Tube Rods or the Amsco MF Semi-Automatic Welder, see your Amsco Welding Distributor. Or write to Amsco Welding Department SA, Chicago Heights, Ill.

AMERICAN Brake Shoe COMPANY

AMSCO

American Manganese Steel Division · Chicago Heights, Ill.

OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS; JOLIETTE, QUEBEC

FREEWAY FOR WATER

There's no stop-and-go to interrupt the smooth traffic in water on this freeway built with Naylor Spiralweld pipe.

The familiar spiral that distinguishes this lightweight pipe also makes it stronger and safer in pipe line performance. The spiral lock gives Naylor pipe greater collapse strength and acts as a continuous expansion joint to absorb shock loads, stresses and strains—characteristics not found in other pipe of the same wall thickness.

Installation is faster and easier with Naylor pipe—especially when joined by the one-piece Naylor Wedgelock coupling, a fast, simple method of positive connection.

It's a good combination to remember for air, water, tailings, ventilating and other services. Write for Bulletins 507 and 513.

NAYLOR

NAYLOR PIPE COMPANY
1242 East 92nd Street, Chicago 19, Illinois

Eastern U.S. and Foreign Sales Office:
60 E. 42nd St., New York 17, New York

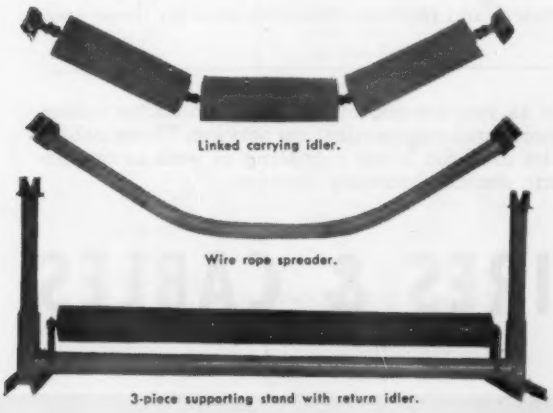
Wet iron ore moves smoothly and quickly in this mine where two Goodman Rope Belts have been installed in sub-levels.

The Goodman *Rope Belt** Conveyor

for metal mine haulage . . . *COSTS LESS TO BUY . . . LESS TO INSTALL . . . HAS HIGHER CARRYING CAPACITY . . . NEGLIGIBLE SPILLAGE*

It's easy to see why initial cost is low. With parallel wire ropes taking place of the usual rigid framing, the saving in the cost of intermediate sections is obvious. Accurate mine records show savings as great as 50%.

The same thing applies to installation and extension. There are no heavy structural units. Parts are few, simple, easy to handle. This is an important advantage where space is limited. Records show savings of many hours in installation and extension time.



Linked carrying idler.

Wire rope spreader.

3-piece supporting stand with return idler.

No tools are needed to add these parts to conveyor line. There is no framing that requires positioning for hooking or bolting together.

Carrying capacity of the Goodman Rope Belt is unsurpassed. The combined "give" of the tensioned, wire ropes and the linked idler assemblies cups the belt to the load, provides low impact shock at loading points and smooth travel along the line. This means less wear and tear on belt and idlers. And it also means that spillage, with attendant clean-up time, is practically eliminated.

Very important, too, is the adaptability of the Rope Belt to uneven bottom without the need of costly cribbing or supports. And the return belt is fully visible, easily accessible.

The Goodman Rope Belt is practical anywhere in a metal mine for any type of service. It saves time and money. It's the most useful conveyor you can buy.

Ask for full details. There's no obligation.

*Trade Mark

GOODMAN

MANUFACTURING COMPANY

Halsted Street and 48th Place, Chicago 9, Illinois

CUTTING MACHINES • CONVEYORS • LOADERS
SHUTTLE CARS • LOCOMOTIVES • CONTINUOUS MINERS

Use Genuine Goodman Replacement Parts

LOOK TO

for Outstanding Advances

Plus A Complete Line of Performance-

Simplex-Tirex Twin Shuttle Car Cables

Feature *Gear-Shaped* insulated conductors that firmly interlock with the jacket so that even continual twisting of the cable will seldom pull them out of position. They will not twist or override each other. The Selenium-Neoprene Armor is CURED-IN-LEAD for extra toughness. Marked P-101 BM. Available as Type W and Type G.

Simplex-Anhydrex XX Cables

High-voltage cables that assure uninterrupted service at 2,000-35,000 volts operation in underground, duct or aerial installations. Insulated with Anhydrex XX, first high-voltage insulation combining all the properties necessary for trouble-free operation when exposed to water and moisture, heat, ozone and other deteriorating agents. Jacketed with a special neoprene compound that provides steadfast protection against rough handling, soil acids and alkalies, oils, grease, chemicals and flame.

Simplex-Anhydrex Signal & Communication Cables

Light-weight, easily installed cables for telephone, signal and communication circuits. Protected by a special neoprene jacket. No metallic tapes necessary. Insulation has ideal electrical and physical characteristics for these uses.

Available as two-conductor or multi-conductor cables for telephone and communication service. These cables can also be used for block signaling as well as operating electric switch-throwing devices.

Simplex WIRES & CABLES

SIMPLEX WIRE & CABLE CO., 79 Sidney Street, Cambridge 39, Mass.

SIMPLEX

in Mine Cable Design . . .

Proved Cables for Every Mine Use!

SERVICE	USE	SIMPLEX PRODUCT
MINING	Electric Drills	TIREX SO Cord, TIREX Heavy Duty Mine Cord.
	Shot Firing	TIREX Shot Fire Cord (Round), Simplex Shot Fire Cord (Twin).
	Shuttle Cars	TIREX Special Shuttle Car Cable (see opposite page).
	Shuttle Cars, Cutters, Loaders, Continuous Miners	TIREX Twin Mining Cable; Type W, without ground wires; Type G, with ground wires. Also TIREX 3-Conductor Round Cable, Type W.
	Locomotives	TIREX Locomotive Cable; steel reinforcing strands in conductor.
	Stripping Shovels and Draglines	TIREX High-Voltage Cables; Types W, G, SH-A, SH-B, SH-C, SH-D.
		All TIREX Cords and Cables are jacketed with CURED-IN-LEAD Selenium-Neoprene Armor. All stock sizes for mine use are marked P-101 BM.
MINE EQUIPMENT	Air Compressors (Portable)	TIREX Twin Cables, Types W and G. TIREX 3-Cond. Round Cable, Type W.
	Air Compressors (Stationary), Ventilating Fans, Mine Pumps, Car Pullers	Anhydrex or Anhydroprene Cables. Both feature the exceptional moisture resistance of Anhydrex insulation and the durability of a neoprene jacket. Anhydrex cables can be installed directly in earth, in conduit and in air. Anhydroprene cables, with lighter jacket, should not be buried directly in earth.
	Track Signal Systems	Anhydrex Multi-Cond. Signal Cable. Polyethylene-Plastex Signal Cable.
	Telephone Systems	Anhydrex Mine Telephone Cable.
PROCESSING EQUIPMENT	Crushers	Anhydrex Cables. Anhydroprene Cables.
	Vibrator Screens	TIREX SO Cords. Anhydrex Cables.
	Flotation Cells	Anhydrex Cables. Anhydroprene Cables.
SHOPS	Machine Tools	TIREX SO and SJO (light service) Cords. Plastex Machine Tool Wire; available with light, heavy and extra-heavy insulation.
	Welding Machines Electrode Cable	TIREX Super-Flexible Welding Cable.
	Welding Machines Electrode Return	TIREX Single-Conductor Cable.
	Welding Machines Power Side	TIREX 2 and 3-Conductor Cables.
	Locomotive Wiring	TIREX Motor Lead Cable.
	Battery Charging	TIREX Twin and TIREX Round Type W Cables.
POWER AND LIGHTING	Aerial Distribution Systems	Anhydrex, Varnished Cambric and Paper Insulated Cables — available with built-in messenger or messenger can be applied in field by spinner.
	Underground Distribution Systems	Anhydrex Cables; provide resistance to water and moisture, soil acids and alkalies; have no metallic sheaths to crystallize and corrode.
	Borehole and Shafts	Anhydrex Cables and Varnished Cambric Cables — available with a wide choice of outer coverings to meet the requirements of all methods of suspension.
	Sub-Surface Distribution	Anhydrex Feeder Cables, Varnished Cambric Feeder Cables.
	Switchboard Wiring	Anhydroprene Wires, Plastex Wires.
	Yard Floodlighting	Anhydrex Cables.

Write for Catalog 1008 — *"Simplex Cables for Mining"*

MSA
SAFETY EQUIPMENT HEADQUARTERS

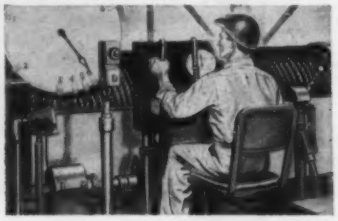
. . . a complete product line that brings greater safety, increased production to mining operations

EDISON ELECTRIC CAP LAMPS - M.S.A. TYPE K HATS

Miners equipped with Edison Electric Cap Lamps have the safety and production advantages of brilliant, unfailing light. This more and better light lets the miner see every detail on the job, work better, with greater safety. The M.S.A. Type K Skullgard provides maximum head protection and comfort. Write for details.

M.S.A. HOISTPHONE

Dependable voice communication between hoisting engineer and moving cage, or at any level. Ideal for load leveling, shaft repairs, inspections. Also available—the M.S.A. MinePhone for instantaneous communication of orders to moving locomotives for improved haulage.



M.S.A. SELF-RESCUER

For immediate breathing protection in emergencies. Vital to the miner while traveling through carbon monoxide to fresh air. Available in cache assemblies for storage throughout the mine, or in individual carrying cases. U. S. Bureau of Mines Approved.

M.S.A. CHEMOX®

Provides complete breathing protection in any atmosphere for a minimum of 45 minutes. Chemox generates its own oxygen from replaceable chemical canister. Weighs only 13½ lbs. Comfortable in service. U. S. Bureau of Mines Approved.

M.S.A. McCAA TWO-HOUR OXYGEN BREATHING APPARATUS

Assures complete breathing protection in unbreathable atmospheres for a minimum of two hours. U. S. Bureau of Mines Approved.

M.S.A. DUSTFOE RESPIRATOR

Light weight, compact, comfortable. A dust respirator that provides maximum protection. U. S. Bureau of Mines Approved.

M.S.A. "ALL-SERVICE"® MASK

Dependable breathing protection against smoke and toxic gases including carbon monoxide singly or in combination, where there is no oxygen deficiency. Unit is U. S. Bureau of Mines Approved.

M.S.A. PNEOLATOR

Automatic artificial respiration device that assures maximum chances of recovery to those overcome by poisonous gases, electrical shock or other causes of asphyxia. Unit is protected by rugged carrying case.

M.S.A. MIDGET IMPINGER

A portable instrument for quick and dependable dust sampling. Entirely self-contained and hand operated. Ideal for dust control and survey work.

OTHER M.S.A. PRODUCTS FOR THE MINING INDUSTRY

Belts—Goggles—Safety Clothing—Carbon Monoxide Tester—Methane Detectors and Recorders—Stretcher Outfits—First Aid Kits and Materials. Send for our Mining Catalog for complete details on all products.

MSA
SAFETY EQUIPMENT HEADQUARTERS

When you have a safety problem, M.S.A. is at your service. Our job is to help you.

MINE SAFETY APPLIANCES COMPANY

INTERNATIONAL DIVISION

201 North Braddock Avenue, Pittsburgh 8, Pa.
Mine Safety Appliances Co. of Canada, Ltd., Toronto 4
Mine Safety Appliances de Venezuela
Caracas, Maracaibo and Puerto La Cruz
Mine Safety Appliances Co., Ltd., Glasgow, E-3, Scotland
Mine Safety Appliances Co. (Africa) (Pty.) Ltd.,
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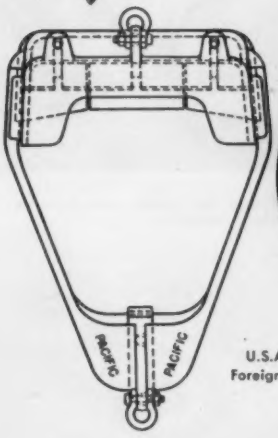
Representatives in Principal Cities throughout the World
Cable Address: "MINSAF" Pittsburgh, Pa., U.S.A.

PACIFIC®
MINING PRODUCTS

Designed by mining men for mining efficiency. Superiority maintained by constant study of the equipment at work plus rigid quality control of production, in our own plant, of tough, wear-resistant, alloy steel components. PACIFIC Mining Products "fit the job" with longer life and greater economy. Complete literature available.



PACIFIC® "SLUSHMASTER" SCRAPERS

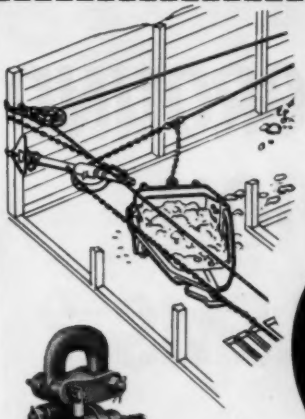
U.S.A. Pat. No. 2716824
Foreign Patents Applied For.

PACIFIC "SLUSHMASTER" SCRAPERS are famous for big load capacity, low horsepower requirements and general "DIGABILITY." Used in practically every mining area thoughout the world. Ask for Bulletin No. 275.

MODEL	SIZE	WEIGHT LB.	APPROX. ROPE PULL LB. REQ.
2A	26"	398	700
2A	30"	485	800
2A	34"	515	900
AB	36"	744	1250
AB	42"	812	1400
AB	48"	951	1750
AB	54"	1064	2100
2B	36"	1280	1900
2B	42"	1395	2200
2B	48"	1520	2450
2C	60"	2360	4400

Larger sizes also available. We specialize in scrapers. Write us regarding your scraping problems.

Ask about PACIFIC Jaw Crushers, PACIFIC Bit Knockers and PACIFIC Tractor and Shovel Wearing Parts.



PACIFIC "ROUND-THE-CORNER" Sheave block eliminates double slushing, cuts costs as much as 50%. U.S.A. and Foreign Patents Applied For. Send for Bulletin No. 259.

PACIFIC® SHEAVE BLOCKS

TYPE "CF" 8", 10", 12"

SHEAVE ANCHORS VARIOUS SIZES

TYPE "C" 8", 10", 12"

WIDE THROAT CARRYING BLOCKS 6" and 8"

6" STANDARD GENERAL UTILITY BLOCK

Half Side Plate and Full Side Plate Models in 8", 10" and 12" sizes with choice of hook, shackle or safety swivel shackle suspension. Manganese steel sheaves and side frames, tapered roller bearings, wide throats. Send for Bulletin No. 271.

ALLOY STEEL & METALS CO.
1848 E. 55th St., Los Angeles 58, Calif. — Mailing Address: Box 58323, Vernon Sta., Los Angeles 58, Calif.

JOY STOPERS—Lightweight and heavy-duty models with standard or telescopic feed, steel changes to 36", short overall length. Write for Bulletin 87-G.

...UNDERGROUND PRODUCTION PROBLEMS ?

DRILL, LOAD, HAUL, HOIST, SCRAPE, VENTILATE

The Modern JOY Way

Whatever your mining problem, there's a modern Joy machine to handle the job quickly, easily, efficiently.

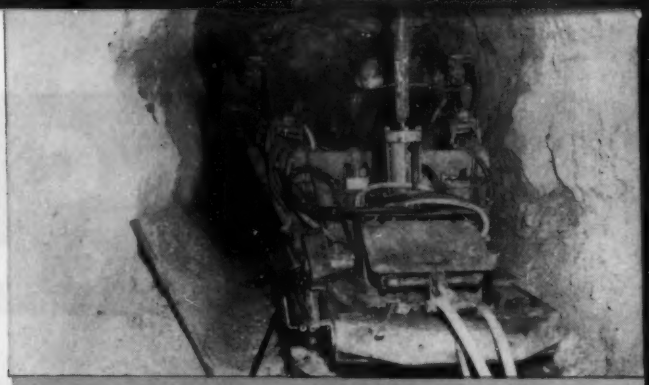
Select the equipment in which you are most interested, and write TODAY for detail-packed bulletins. ***Joy Manufacturing Company, Dept. 31, Oliver Building, Pittsburgh 22, Pa.*** *In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

JOY

WSW M 5360-60

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

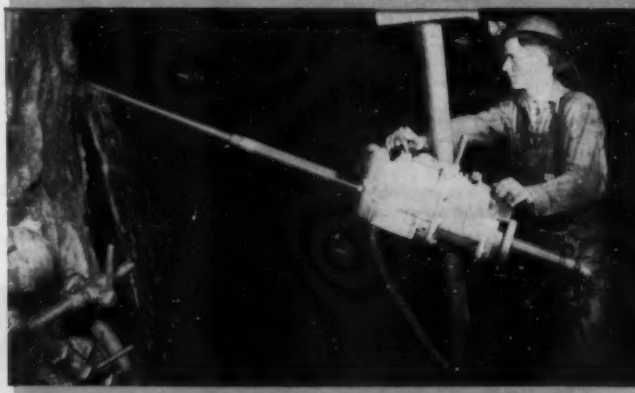
Other Joy Products—OPEN CUT BLASTHOLE DRILLS • DIAMOND CORE DRILLS • DIAMOND BITS • WAGON DRILLS • ROCK BITS • HAND-HELD DRILLS • BREAKERS • TAIL ROPE SHEAVES •



JIB JUMBO—Track-mounted Jumbo with drills on hydraulically-controlled Hydro Drill Jibs for fast, easy drilling. Ask for Bulletin 87-F.

DRILLMOBILE—Rubber-tired, self-propelled Jumbo with drills on Hydro Drill Jibs. Long chain feeds. Bulletin 87-F.

AIR LEG—Easy-to-handle air leg with "one-hand control" built into drill backhead. Perfect in combination with Joy LM-47 Drill. Bulletin 87-M.

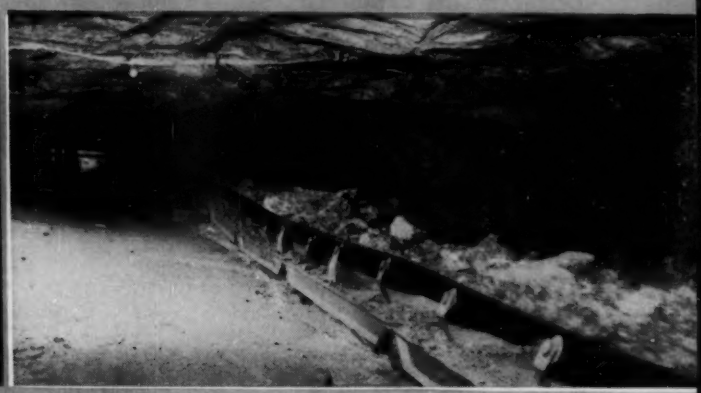


HS-15 CORE AND BLASTHOLE DRILL—Air-driven rotary drill for column mounting. In-line drive. Choice of speed ranges. Bulletin D-32.

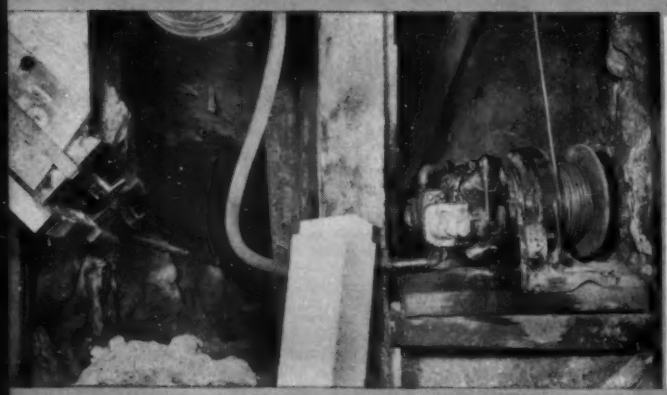
18-HR-2 LOADER—High capacity loading machine for rock and ore. *12 tons per minute.* Ruggedly built to withstand rough usage, abrasion. Bulletin J-108.

SHUTTLE CARS—Cable reel, battery, or diesel-electric types in various capacities. Extra rugged for rock and ore haulage. Bulletin J-202.

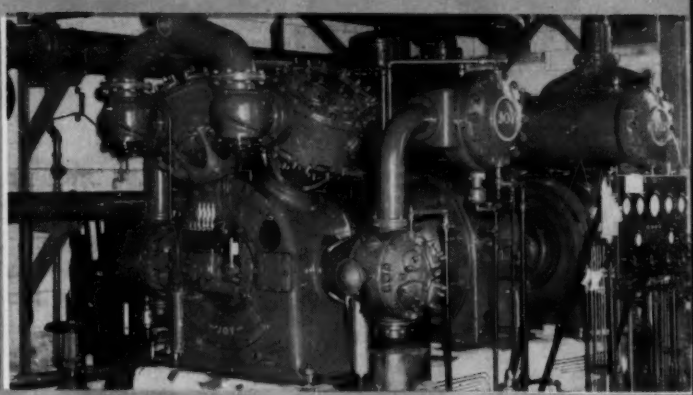
ELECTRICAL CONNECTORS—Watertight, one-piece Neoprene connectors for use with any electrical mining equipment. Sizes and styles for all uses. Bulletin B-56.



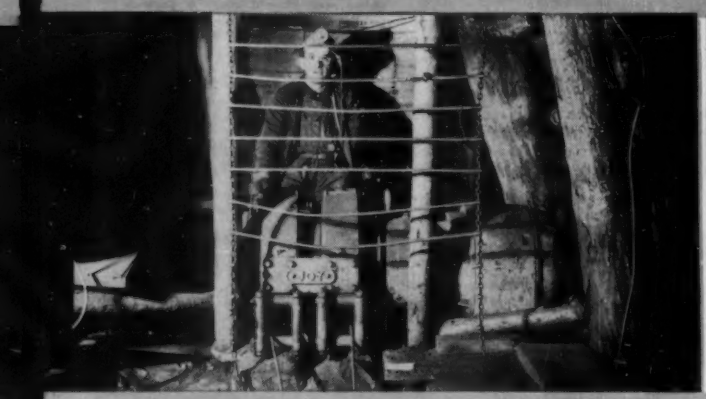
JOY CONVEYORS—Complete line of belt, shaker and chain conveyors for any underground application. Bulletin LD-102.



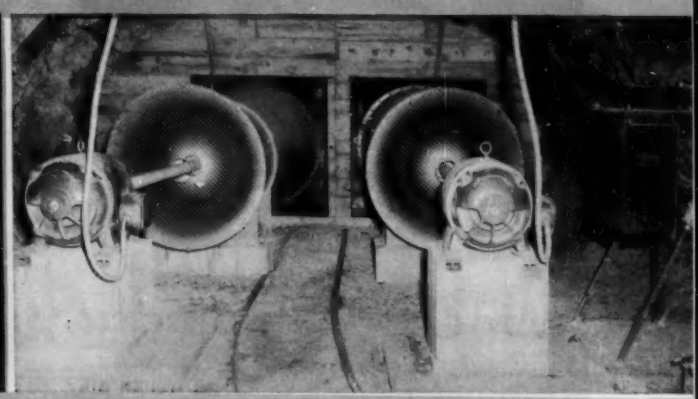
SINGLE DRUM HOISTS—Air or electric drive, lifting capacities 500 to 3500 lbs., rope capacities to 1500 feet. Bulletin 76-X. Also single and two-drum shaft hoists to 150 HP.



AIR COMPRESSORS—Dependable air power supply. Displacements from 81 to 3896 CFM. Single and two stage units for every need. Bulletin M-201.



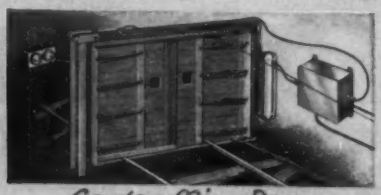
SLUSHERS—Two and three-drum models, 5 to 150 HP, rope pulls to 15,000 lbs., air or electric drive. Bulletin 76-Y.



AXIVANE FANS—Portable blowers, adjustable-blade fans, and large mine fans. A size for every ventilating job. Bulletin J-607.

Half Century Rugged, Dependable profit-paying Equipment

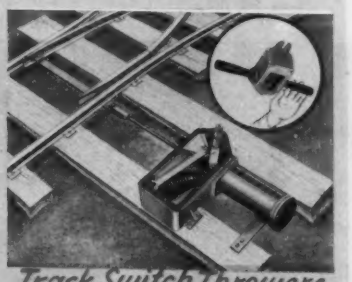
A·M·D·CO



Canton Mine Door

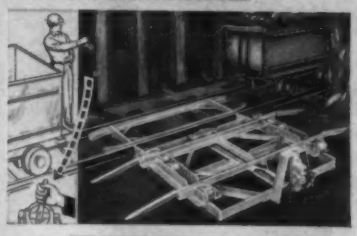
The Automatic Door operates mechanically by weight of car on activating levers. Air power operation may be had where desirable. Operates at any trip speed. Two doors provide air lock.

Install "Canton" American Mine Door Products in your Mine. Pay us out of increased profits.



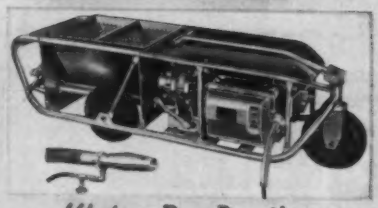
Track Switch Throwers

Electric or air operated. Route selections made by motorman at full trip speeds. Eliminates accident potential and extra man. Also ideal as Derailer.



Canton Car Transfers

No alterations to track. Quickly installed and relocated—less rib to shoot than for jump switch—no hazards of cherry picker. Anti-friction bearings for easy hand operation. Manual or compressed air models available. (Air model illustrated.)



Wet or Dry Dusting

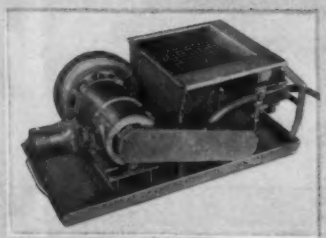
"Canton" Little Chief goes anywhere . . . rubber tire model 22½" high; skid model 18½" high for shuttle buggies, belts or mine cars; track-mounted for haulage roads. Delivers 34 to 60 lbs. dust per minute through 50 to 400 ft. 1¾" hose.

Dustmaster

The Track Mounted Hi-Pressure "Dustmaster" is the most powerful Duster ever built. Distributes dust to back areas 500 ft. from haulway.

Canton Track Cleaners

Hydraulic controls throughout clean entire track area mechanically in one pass—no costly hand labor; no dozers or loaders required. Now operating economically in coal, iron, copper, lead, potash, and salt mines.

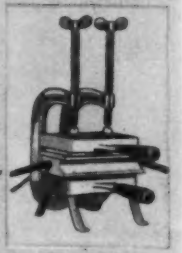


Mighty Midget

Weighs only 280 lbs. Easily moved on shuttle car. Hand cart available. Ideal for small mines . . . inexpensive . . . capacity 7 tons per shift.

Canton Cable Splicer

"Canton" Cable Splicers reduce down time in splicing cable. Machine men should carry a pocketful. Just pound around cable and go on working. No special tools.



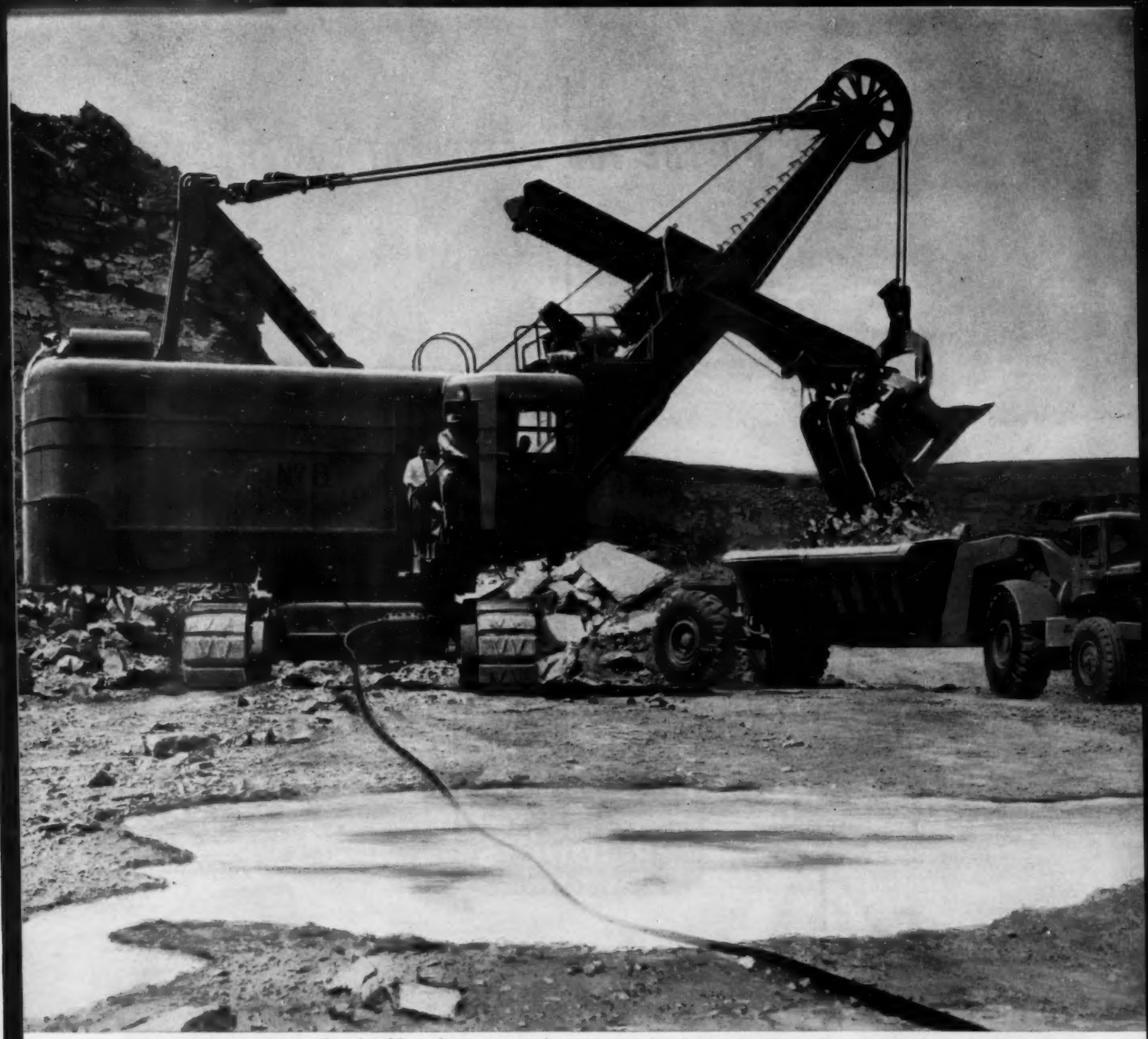
Canton Vulcanizer

Restores insulation to original condition. Used with Canton Splicers, strong as original cable.

The American Mine Door Company

2071 Dueber Ave., Canton 6, Ohio

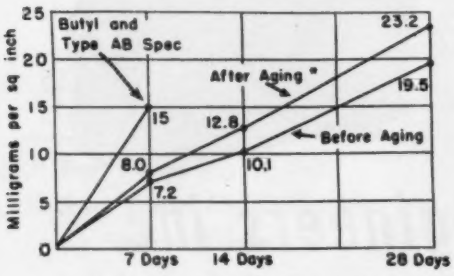
Write for complete brochures. Please use street and zone numbers.



ANACONDA TYPE SH-D Shovel Cable with neoprene jacket, Type AB butyl insulation—a good companion in wet locations.

New champ in the "old swimming hole"

—Anaconda Type AB butyl-insulated Shovel Cable



RESULTS OF mechanical moisture absorption test show Type AB absorbs less than *half* the moisture Industry Specifications allow.

Where shovel cable is exposed to rain, snow or wet spots — moisture-resistant properties of the jacket *and insulation* are vitally important.

Latest test results show Anaconda Type AB butyl insulation (used in Anaconda Shovel Cable) *absorbs far less moisture* than the criterion set up by Industry Standards.

Result: longer cable life . . . greater freedom from failure . . . less down time for users of Anaconda Type AB-insulated Shovel Cable.

NEW ENGINEERING BULLETIN EB-27 has full details on performance of Anaconda butyl insulation in 15 Industry Specification tests. Ask the Man from Anaconda for your copy. And see your Anaconda distributor for your Shovel Cable. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y. 57319

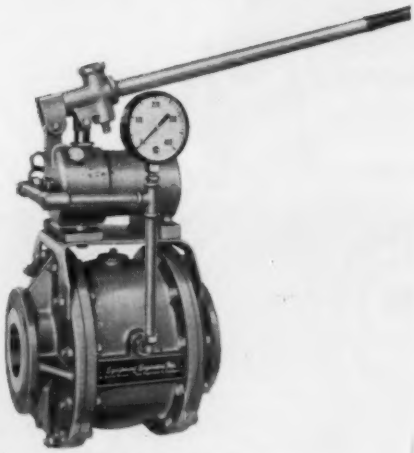
SEE YOUR ANACONDA® DISTRIBUTOR FOR SHOVEL CABLE

EE PRODUCTS DO THE JOB BETTER AT LOWER COST!

Model EE20-9
integral two stage

Krebs Cyclones

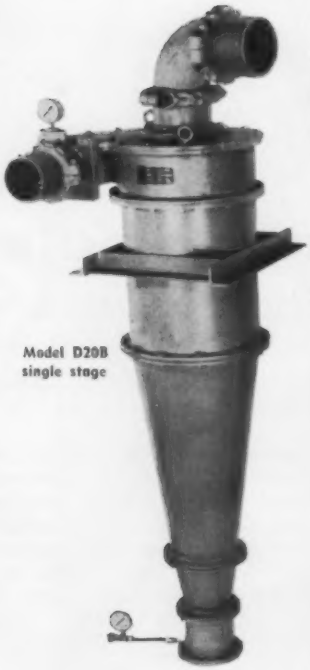
Longs sweep inlet for better performance and capacity at lower psi. Molded replaceable pure gum rubber parts throughout. Adjustable apex valves for all sizes.



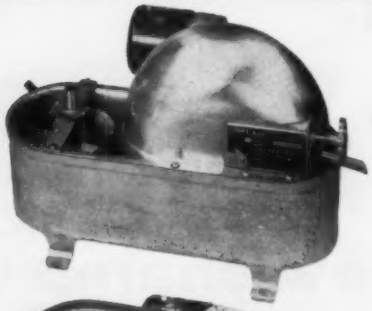
Krebs Valve

The round hole, center flow makes it the most efficient valve for heavy duty service. Knows no maintenance expense. Hydraulically operated—remote if desired. Write for performance curves showing quickly responsive control.

EE
PRODUCTS



Model D20B
single stage



Model E in 18-8 stainless steel. Also available in duplex and triplex units.

Clarkson Reagent Feeders

The standard for precise and low cost feeding of reagents throughout the world. The Clarkson Company is a Division of EE Inc.

Model E in PVC for acids.

equipment engineers inc.

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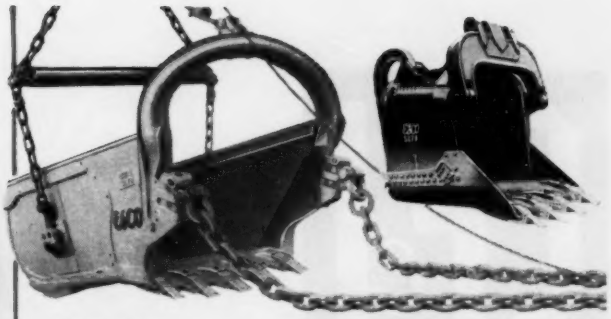
look to ESCO for OUTSTANDING PERFORMANCE through metallurgical engineering

Wear Cap available on large sizes only.

ESCO 12 M Tested Points and Wear Caps More Than Double Performance Life.

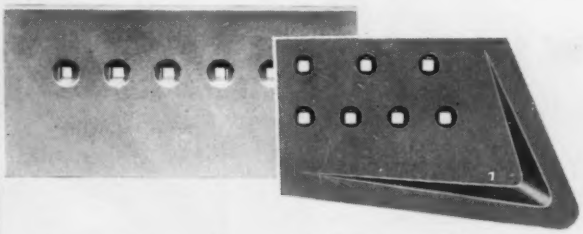
Cast of *ESCO* 12 M, *ESCO* Tested Points and Adapters are metallurgically engineered to the severe conditions of mining operations. *ESCO* Wear Cap Adapters are now available with replaceable, slip-on Wear Caps for longer Adapter life.

Every *ESCO* Point is Brinell tested before shipment to assure absolutely correct degree of hardness. *ESCO* points start sharp, stay sharp longer. Five *ESCO* Points can be removed and replaced in five minutes, cutting downtime to a minimum.



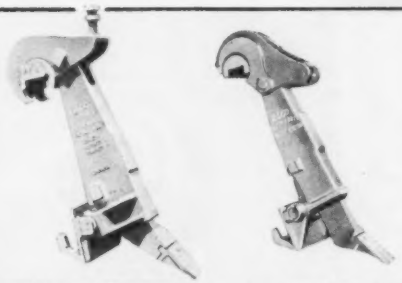
ESCO Dragline Buckets and Dippers Designed For Greater Payload, Less Maintenance.

ESCO builds a complete line of dragline buckets, dippers, backhoes and orange-peels. All critical wear points on *ESCO* buckets are heavy-duty manganese steel castings, highly resistant to shock and abrasion of rugged mining operations. All *ESCO* buckets are metallurgically tailored for extra strength with less weight, and designed for greater payload and sharply reduced maintenance. *Special loading dippers or draglines can be built to your specifications.* *ESCO* also manufactures a complete line of solid-cast chain and dragline replacement parts.



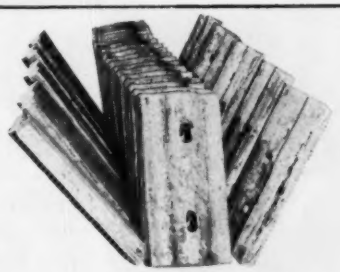
ESCO Cutting Edges and End Bits Last Longer on Tough Mining Jobs.

The shock and pounding of rough work actually makes the surface of an *ESCO* Cutting Edge more wear resistant—yet the core retains high impact toughness regardless of age or usage—even in sub-zero temperatures. *ESCO End Bits* stay on the job longer—even in sand and extremely abrasive material—because they are cast of *ESCO* 12 M.



ESCO Dozer Rooter® Rips Rock, Hardpan, Cuts Stripping Costs Up To 50%.

An *ESCO* Buck Forte Dozer Rooter outperforms a drawbar ripper, minimizes powder work by ripping through hardpan, rock, coal and shale. Easily installed by one man on the blade of a straight or angle dozer. Rooting depth is adjustable. An *ESCO* Dozer Rooter is portable enough to carry on the tractor from one area to another. Sizes available to fit any dozer or angle dozer.



ESCO Castings For Every Mining Requirement.

ESCO can furnish impellers, rabble arms, roaster arms, chute liners, grates, special valves, conveying chain, ball mill liners, mill hammers or any special castings. *ESCO* has complete foundry facilities for static, centrifugal or shell castings of any size, shape or quantity in a wide range of alloys. Complete application engineering service available if needed.

For Details
See Your ESCO Dealer or Write Direct

ESCO® ELECTRIC STEEL FOUNDRY COMPANY

2147 N. W. 25TH AVE. • PORTLAND 10, OREGON

MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.

Offices in Most Principal Cities

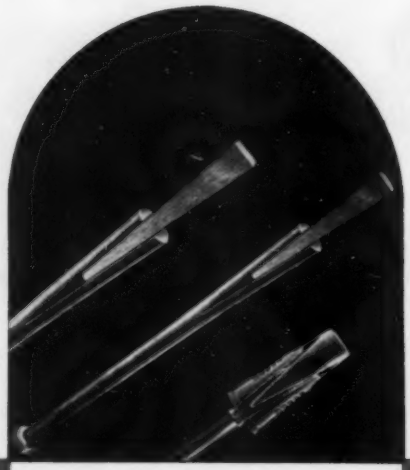
ESCO INTERNATIONAL, NEW YORK, N. Y.

IN CANADA ESCO LIMITED

CF&I steel products for the mining industry

WICKWIRE ROPE

Wickwire Rope is a high-quality product recognized for over half a century for its dependability. There is a type for every application. Wickwire Rope combines toughness with fatigue resistance and will provide safety and long life.

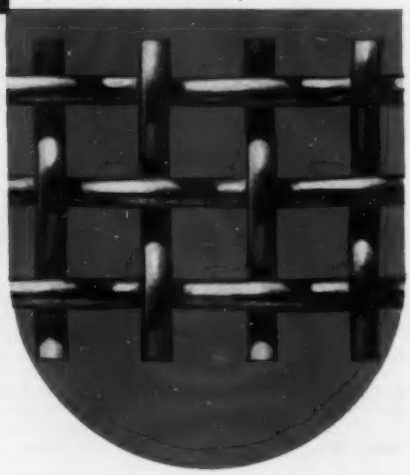


CF&I SPACE SCREENS

CF&I Space Screens are fabricated in a wide range of types of the toughest steels and alloys. Whether for processing, cleaning, grading, filtering or screening, for any type of equipment, you will always get the results you need for efficient operation with CF&I Space Screens.

CF&I ROCK BOLTS

Here is the modern mine roof, wall and back support that means clear, safe mining with a minimum expenditure of labor and materials. Available in the Pattin expansion shell type or the slot-and-wedge type.



THE COLORADO FUEL AND IRON CORPORATION
Denver and Oakland

WICKWIRE SPENCER STEEL DIVISION
New York, New York

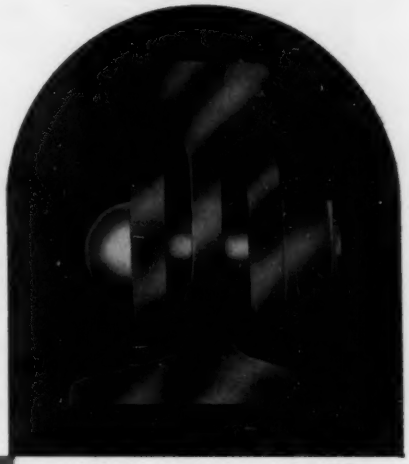
CF&I OFFICES IN CANADA: Toronto • Montreal

7609

CF&I quality steel products for the mining industry are manufactured under the most rigid quality control. Important to you, as well, is the fact that these products are in everyday use in our own mining operations. This is an additional assurance of products made *well* and made *correctly*.

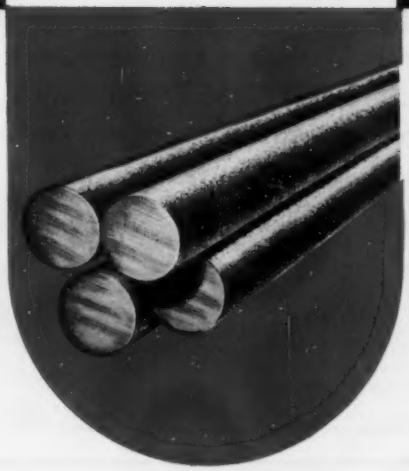
CF&I GRINDING RODS

CF&I Grinding Rods are rolled from special analysis steel and are machine-straightened with square-cut ends to give efficient and economical grinding.



CF&I GRINDING BALLS

Your mill will operate efficiently and economically when you use CF&I Grinding Balls. Forged from special analysis steel, CF&I Grinding Balls have the ideal balance between toughness and hardness, resulting in optimum grinding ability as well as in maximum wearability.



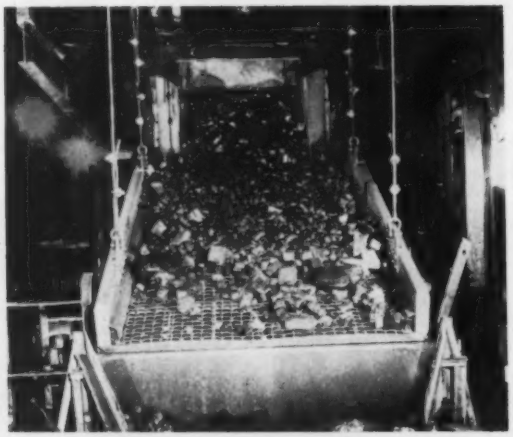
CF&I MINE RAILS & ACCESSORIES

Rails are available in a range from 12 to 45 pounds and are made to A.R.A. standards. Accessories include splice bars, angle bars, spikes and track bolts and nuts—both square and hexagon.

THE COLORADO FUEL AND IRON CORPORATION

CF&I

GYROSET VIBRATING SCREENS
FOR
SIZING AND DEWATERING
MEAN
TOP PRODUCTION AND GREATER EFFICIENCY



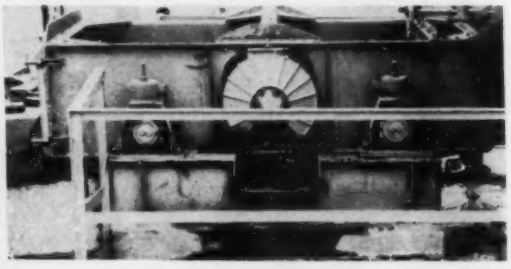
POSITIVE ECCENTRIC ACTION
POSITIVE STROKE ADJUSTMENT
with only 2 bearings

The positive eccentric action of GYROSET Screens gives a full circle throw over the entire length and breadth of the screen surface. With a two-bearing action, movement is achieved with the fewest moving parts.

Experienced mining operators install GYROSET Screens to insure top sizing performance at a minimum cost.

GYROSET Screens can effectively scalp, size or de-water. Due to their adjustable action and their ability to operate at high speed and with any degree of pitch GYROSET Screens will work at a higher capacity than any other screening unit. With positive action GYROSETS can handle dry or wet sizing of ores in a wide variety of sizes at maximum capacity and efficiency.

Construction is simple and rugged. One to Three decks. 18″ to 72″ in width—4′ to 16′ in length. Dust tight units available.



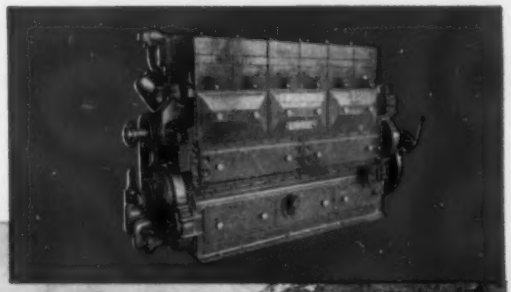
There is a GYROSET Screen for every ore processing operation.

Write us for full details and complete specifications.

PRODUCTIVE EQUIPMENT CORP.

2926-28 West Lake Street **Chicago 12, Illinois**

powered by White's Superior Diesel



Manitowoc 4500 cuts Ohio Stripper's cost 20%

Careful equipment selection is paying off for Terramana Brothers Coal Co., Steubenville, Ohio. For digging into 70 feet of overburden, they chose a Manitowoc 4500 shovel . . . and wisely specified the rugged, dependable White Superior Diesel for power. According to Terramana Brothers, this perfect combination greatly increased production and cut operating costs . . . resulting in more than 20% overall savings!

The big 4-yd. rig with a 60-ft. boom and a 45-ft. stick works two 10-hour shifts daily, powering away almost 400 yards per hour. The high torque Superior engine provides more line muscle . . . it pulls a full dipper with little effort. Under light load, it enables swings at top speed without surging. The faster and smoother cycle increases production!

Many cost saving advantages of Superior's design simplicity also contribute greatly to this economy. Easy accessibility of internal parts speeds servicing in close quarters. Down-time is practically eliminated because maintenance and repairs are reduced to a minimum. Many case histories show 35,000 engine hours with no major replacement parts required. Superior's first valve job usually comes due long after other engines would be completely replaced! Highly developed, open chamber combustion achieves optimum air and fuel mixture, low fuel consumption and easy starting. Precision construction throughout reduces wear and assures lowest lube oil consumption.

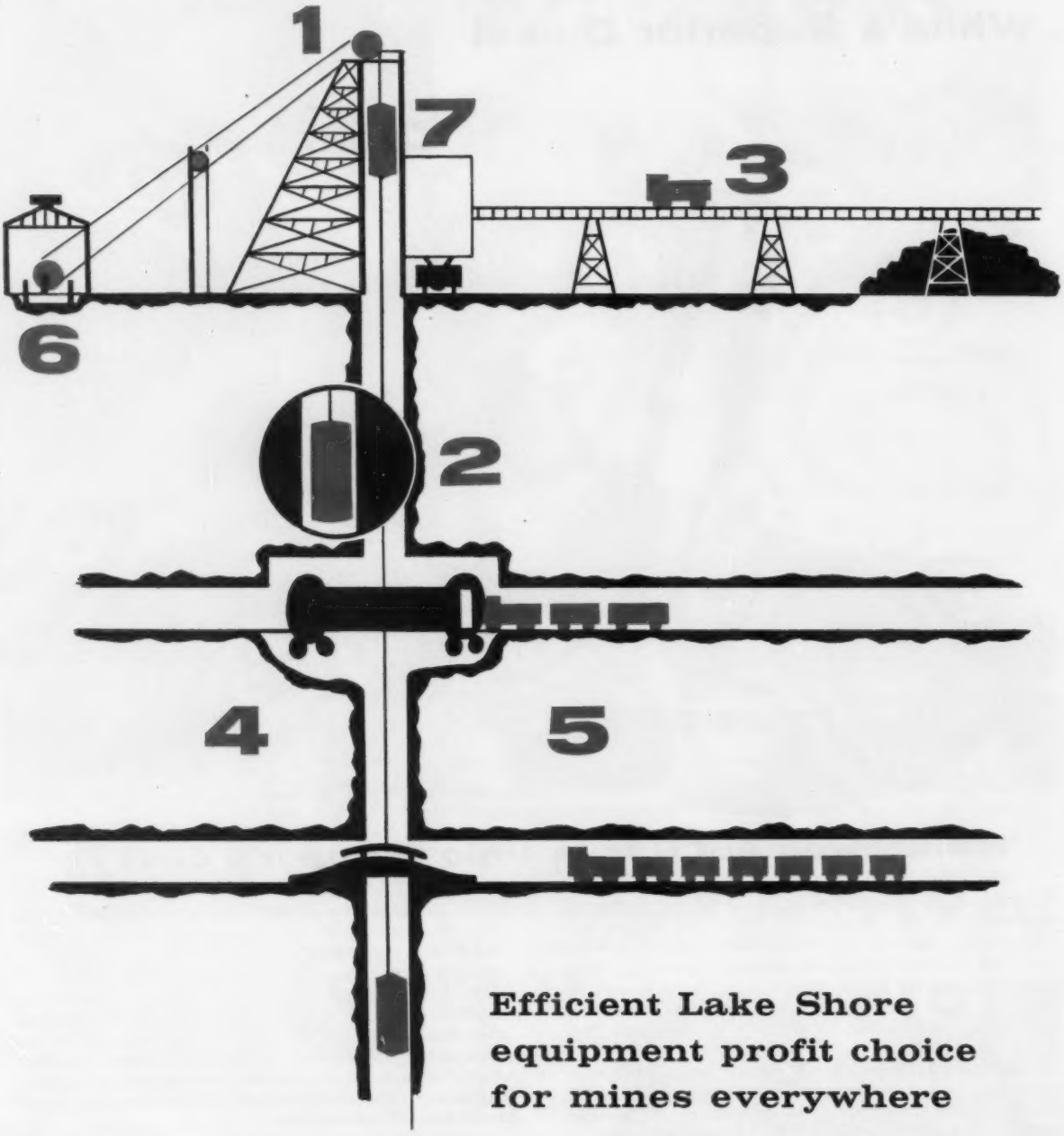
Specify White's Superior Diesel on your next new shovel or when you're re-powering. Power ranges from 225 to 2150 B.H.P. for all types of service. *Write for complete information today.*

White Diesel

WHITE DIESEL ENGINE DIVISION
THE WHITE MOTOR COMPANY

Plant and General Offices: Springfield, Ohio

SEVEN PLACES TO



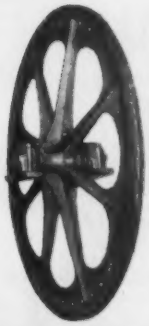
Efficient Lake Shore equipment profit choice for mines everywhere

Key to lower mining costs is efficient, dependable equipment. That's why, for almost a century, leading companies have constantly picked Lake Shore mining machinery to maintain highest production at lowest cost.

The points on this diagram summarize the general product lines produced in our Iron Mountain and Marquette plants. The variety of standard mining equipment manufactured by Lake Shore runs into the hundreds—yet no job is too big, too small or too special for our design and engineering facilities.

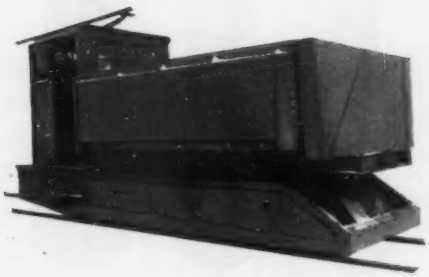
Keeping ore handling costs in line is a big job. But it can be much easier if the equipment you use has the quality and lasting, low-cost performance features that are built into every Lake Shore product. Specific information on our standard products specially designed to your needs, is yours free. Contact your nearest Lake Shore Branch, or write for product bulletins.

CUT MINING COSTS

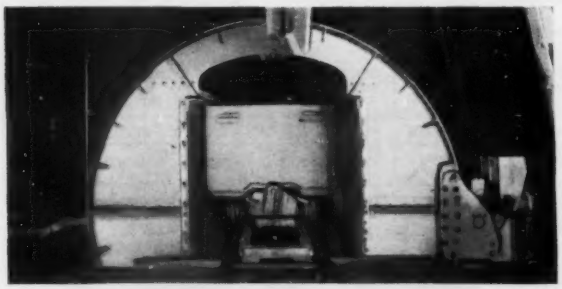


1 Lake Shore Idler, Carrying and Head Sheaves are available in many sizes and types. A new fabricated sheave represents the latest in design and construction.

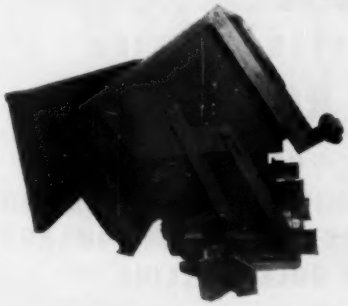
2 This double deck 80-man cage is one of many different types of vertical and inclined cages obtainable. Combination skip and cage also available for various requirements.



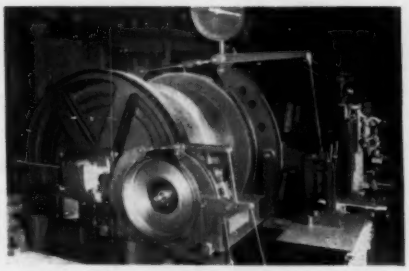
3 Trestle cars of all types are designed to individual specifications. Fit many applications.



4 Car dumpers for various special operations are available. This rotary dumper is one unit. Also camelbacks and other dumpers.



5 Lohed tram car in dump position shows strong, lightweight construction. Dumps clean every time. A complete line of mine and man cars.



6 Many new and original features in hoist design and construction, incorporated in Lake Shore hoists, have set new standards of performance and safety in many mines. This is one of many offered by Lake Shore.

7 Vertical skips, inclined skips—all from Lake Shore. The patented "Jeto" bottom dump skip is shown here. Also Kimberly skips. For every shaft or headframe.

BRANCH OFFICES:

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1025 London Road, Duluth
211 Wazee Market, Denver
37 California St., San Francisco
610 South 19th Avenue, Phoenix
8 South Michigan, Chicago

LAKE SHORE, Inc.

Lake Shore Engineering Division

IRON MOUNTAIN 7, MICHIGAN

HAWTHORNE
"Blue Demon"
TUNGSTEN CARBIDE
INSERT ROCK BITS *for*
all-formation rotary
URANIUM ★ MINERALS EXPLORATION
DIAMOND CORE ★ MINING and QUARRY
BLAST HOLE DRILLING

Available in Types "MP", "DB", "AC" and "SH", in range of sizes from 1⅞" thru 8¾".

"Blue Demon" Bit Body showing component parts. Blades are interchangeable in any fractional size within the range of each assembly. Reamer is optional.

Development of the "Blue Demon" tungsten carbide insert rock bits has greatly increased the cutting capacity of Hawthorne bits in harder formations where rotary methods are used for blast hole, diamond or minerals exploration drilling. Long considered the most efficient all-purpose small hole rotary drilling bits in the petroleum exploration industry, "Blue Demon" Insert Bits are now producing fast, low-cost footage in the quarrying and mining industries.

The bit body, which becomes a permanent part of your drilling equipment, is used with many sets of long-lasting, low-cost expendable blades designed to be completely worn out and discarded. New blades are easily installed with tools available on the drill, giving the driller factory controlled on-the-drill bit service, without the expense or delay of costly retipping or rebuilding.

"Blue Demon" Bits are furnished with box or pin connectors to fit drill rod or drill pipe commonly used with portable drilling equipment.

TYPICAL "BLUE DEMON" BIT BODY With Carbide Insert Blades installed. They are interchangeable with Finger or Pilot Blades.

TYPE "MP" (with reamer) 1⅞" - 3"

TYPE "DB" (with reamer) 3" - 4¼"

TYPE "AC" (with reamer) 4¼" - 6¾"

TYPE "SH" (with reamer) 5⅝" - 8¾"

U. S. PATENTS 2,615,694 2,666,622 OTHERS PENDING

7043

PRICE LIST—TYPICAL "BLUE DEMON" BITS COMPLETE WITH STABILIZERS AND BLADES				
TYPE "MP"		TYPE "DB"	TYPE "AC"	TYPE "SH"
$62.50 With E, A, or B-rod sub, reaming stabilizer and set of BX Insert Blades.		$77.00 With N-rod sub, reaming stabilizer, and set of 3⅞" Insert Blades.	$78.50 With N-rod sub, reaming stabilizer, and set of 4¾" Insert Blades.	$195.00 With 3½" API Reg. sub and 6¼" reaming stabilizer and 6¼" Insert Blades.
TYPICAL PRICES FOR REPLACEMENT BLADES, PER SET (3), ON BIT BODY PRICED ABOVE				
Hard Formations INSERT Blades	$21.00	$22.00	$22.50	$68.00

Write for illustrated catalog covering complete range of "Blue Demon" Bit sizes for all your rotary requirements.

HERB J. HAWTHORNE INC.

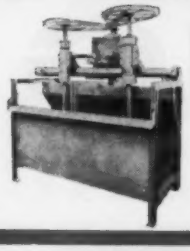
P. O. BOX 7366, HOUSTON 8, TEXAS

CABLE ADDRESS: HAWBIT

controlled metal hardness means

8 indispensable MACHINES for MILL & LABORATORY

1

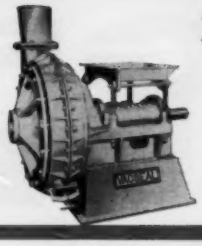


AGITAIR® FLOTATION MACHINE

Renowned throughout the world for high recovery performance . . . low cost operation.

VACSEAL PUMP

A complete line of solids handling and acid pumps. Sizes 1½" to 8".



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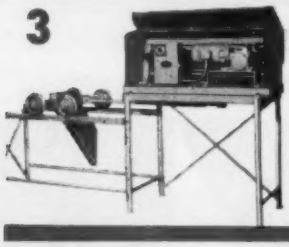
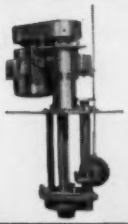


GEARY-JENNINGS SAMPLER

Accurate, automatic samples of practically all types of material.

GALIGHER SUMP PUMP

Available in standard or acid-proof construction. No seals, packing or submerged bearings. Sizes 1½" and 2½"—capacities 10 to 250 GPM.



4

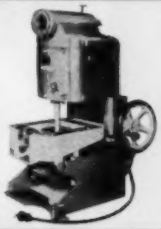
5

GEARY REAGENT FEEDER

Designed to feed accurately all types of liquids and solids in suspension. Capacities range from 25 cc. to 10,400 c.c. per min. per cup.

LABORATORY AGITAIR®

500, 1000, 2000 gram employing the same principle of flotation as the world-famous commercial AGITAIR®.



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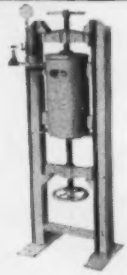
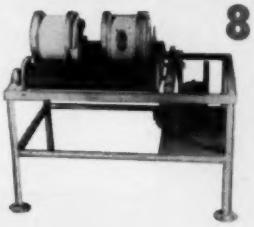


LABORATORY PRESSURE FILTER

Simple, rugged design, 3½ gal. capacity. Operates at pressures up to 125 psi.

LABORATORY BALL MILLS

Designed for 1 or more mills with grinding capacity of 1000 to 2500 gram charge per mill.



8

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AP-503

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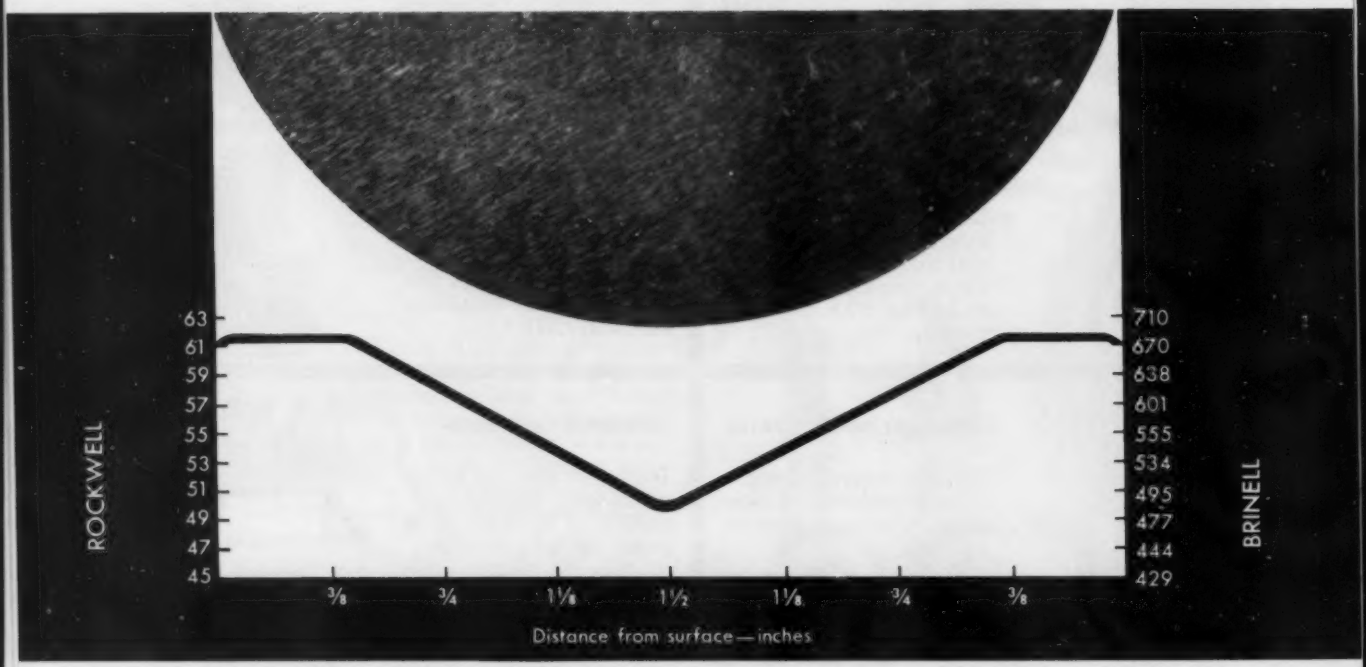
GALIGHER PRODUCTS: AGITAIR® Flotation Machine, VACSEAL Pump, Geary-Jennings Sampler, Acid-proof Sump Pump, Geary Reagent Feeder, Laboratory AGITAIR® Flotation Machine, Laboratory Pressure Filter, Laboratory Ball Mill, Rubber Lined and Covered Products, Plastic Fabrication.

controlled metal hardness means

heat-treated cast alloy steel

NACO GRINDING BALLS

cut per-ton grinding costs



Note how new casting process and full heat treatment show controlled hardness between surface and inner core.

Spectrographic analytical control of elements in steel making processes and controlled heat treatment assure the desired metallurgical grain structure which produce the type of hardness required for maximum wearing qualities.

Performance reports on Naco solid cast alloy steel grinding balls from mills now using them have been universally favorable—both in lasting qualities and impact absorption.

Structurally, they possess a grain closely approaching tool steel—tough, hard and rugged for long lasting qualities. Laboratory tests show a remarkable uniformity in solidity, both under X-ray and specific gravity tests, with controlled hardness holding to a desired depth.

AA-5058

CAPITOL FOUNDRY DIVISION

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Established 1868

GENERAL CABLE SUPER SERVICE

PORTABLE POWER and MINING CABLE

3 Conductor Type SH-D Size No. 2AWG 15KV
3 Conductor Type G Size No. 2AWG 600V P-110 BM
3 Conductor Type W Size No. 2AWG 600V P-110 BM

with SUPERTUF Jacket

GENERAL CABLE offers a complete line of SUPER SERVICE portable power and mining cables which will stand up under the most severe operating conditions and furnish longer life and reliable service no matter how difficult the application.

All SUPER SERVICE cables are jacketed with an extra heavy duty, vulcanized in mold, double layer cord reinforced "SUPERTUF" neoprene sheath with maximum resistance to tearing, cutting, abrasion and overall mechanical abuse, and possessing outstanding resistance to water, oil, acids, alkalis, flame and effects of sunlight and weathering.

SUPERTUF neoprene jacket far exceeds the requirements of ASTM D-752, and all 600 volt SUPER SERVICE portable cables bear the official approval number P-110 BM embossed in the jacket indicating compliance with the flame resistance requirements of the Pennsylvania Department of Mines and requirements of the Federal Bureau of Mines.

GENERAL CABLE CORPORATION, 420 Lexington Avenue, New York 17, New York
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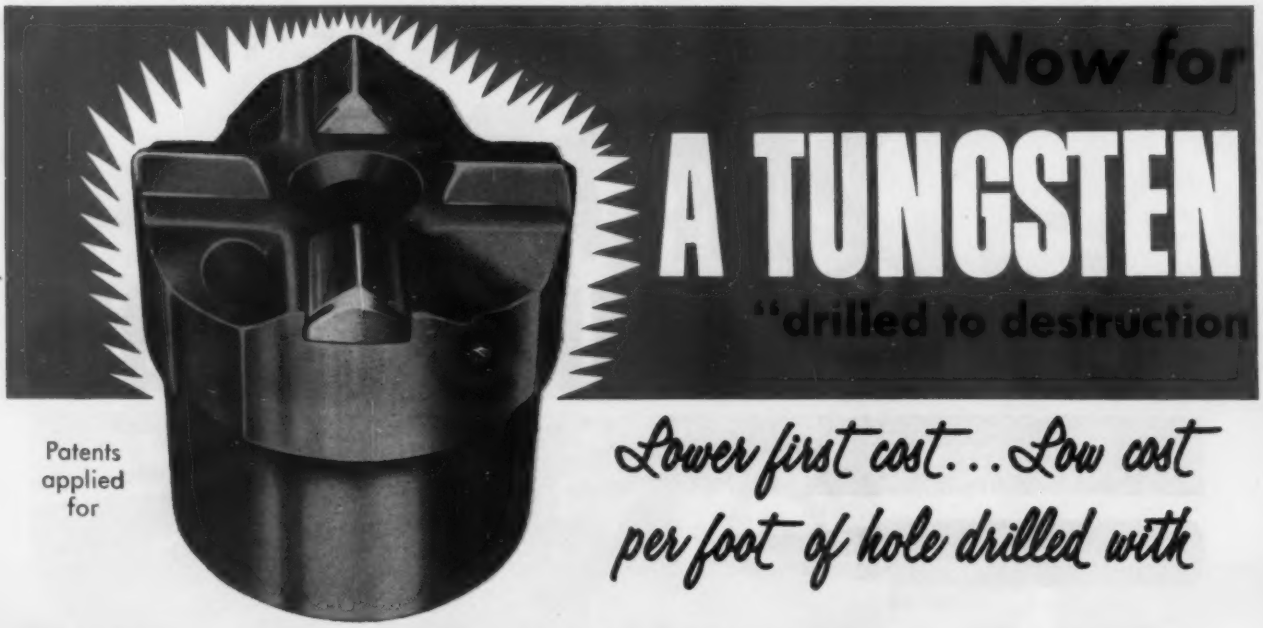


Patents applied for

Lower first cost... Low cost per foot of hole drilled with

LIDDICOAT

the new bit you have heard and read about

Forged for Toughness

The Liddicoat Tee Cee bit body is produced entirely by forging. By a patented and exclusive manufacturing process, the hot alloy steel is subjected to tremendous pressure which extrudes the steel in the desired shape. This method preserves the important grain of the steel, flow lines being compressed rather than cut across as is usual in forgings of this type. The retention of the unbroken grain and the compression of the steel provides Liddicoat bits with an unusually strong tough body.

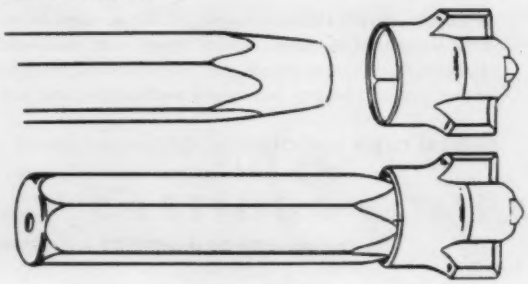
Longer Life from Interesting New Insert

In examining the Liddicoat Tee Cee bit, you will note the shallow tungsten carbide insert (patents applied for). It is the design of this insert that provides the unusual performance of the Tee Cee bit.

Experience with the conventional multi-use insert bit indicates that the bit will usually dull at a given footage,the distance, of course, depending on the type of rock. The dulling point of the multi-use carbide bit is not to be considered as the life of the Liddicoat single-use Tee Cee bit, for experience proves that the Liddicoat "used to destruction" Tee Cee bit drills far beyond the average dulling point of the multi-use Carbide bit.

Taper Socket–No Threads – Fast, Firm Attachment

The type TS Tee Cee Liddicoat (no resharpening) bit has a completely new taper socket connection. Within the socket of the bit is a brass shim. The socket, which is completely forged, is tapered to correspond to the taper placed on the drill rod. The connection assures an absolute attachment to the rod, and yet permits easy removal. The taper socket has been especially designed for the single pass Tee Cee bit.



the first time

CARBIDE INSERT BIT

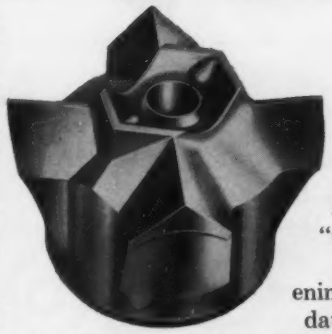
without need of resharpening"

For those who use steel bits

The Fast Drilling

LIDDICOAT STEEL BIT

"used to destruction – no resharpening"

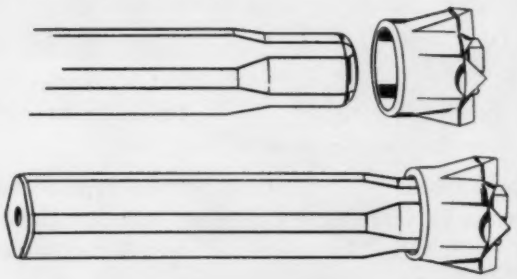


The Liddicoat steel bit is one of the first detachable bits made for "use to destruction without resharpening." Early patents date back more than twelve years. Through years of experience in the use and production of millions of bits, Liddicoat has reached a high state of perfection and popularity.

The Liddicoat bit is forged from steel made to our exact specifications. Provided in the design are unique high performance features which cannot be designed into the conventional multi-use bit, which has to be resharpened. The outstanding features of the Liddicoat bit are the pilot construction and wing design. The pilot chips the rock ahead of the cross wing and eliminates the pulverizing action common to the conventional cross bit. Of prime importance is the strong attachment without threads.

Method of attachment

Diagram (right) shows the Liddicoat Drill bit, before and after attachment, where quarter octagon steel is used. In such case, the "wings" of the bit line up with the corners of the rod, the flat sides within the bit socket being the "wings." The machine blow completes bit seating. The harder the rock, the tighter the lock.



WESTERN

Rock Bit Manufacturing Company

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PROSPECTING FOR URANIUM?

ELECTRO-TECH HAS THE INSTRUMENT FOR YOU IN THE RL-1

The RL-1 produces a permanent record of radioactivity in SHOT HOLES, CORE HOLES or SURFACE OUTCROPS. Basic components of the instrument are:

1 Radioactivity Counter — Eberline mine evaluation instrument of the highest-quality geiger type.

2. Graphic Recorder — Varian type modified for use with the counter. Ball-point pen writing, with Servo actuated rectilinear trace presentation.

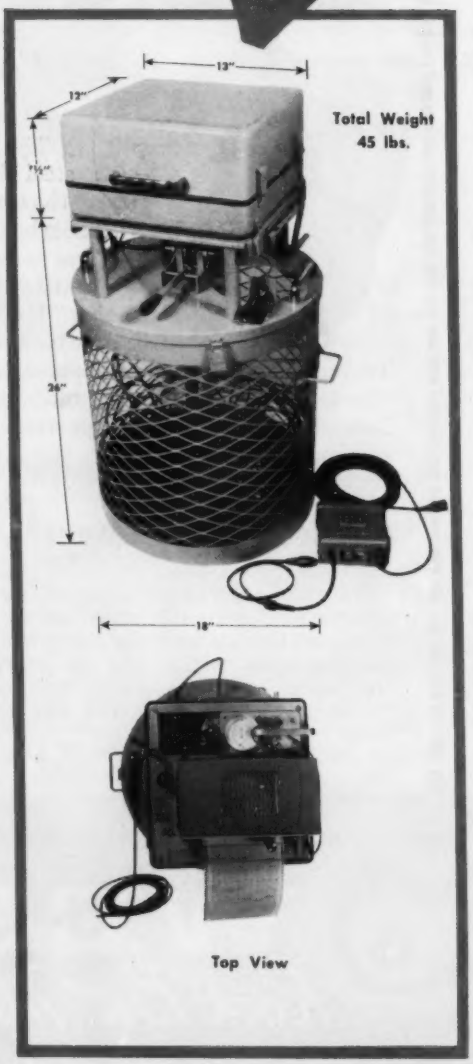
3. Cable and Chart Drive — Squirter-type cable drive has 180° wrap on the drive sheave . . . insures uniform logging speed and absence of slippage. Chart drive is sprocket-chain reduction . . . 1 inch of chart motion for 8 feet of hole.

4. Cable — 250 ft. of 320-lb. breaking strength . . . tough, wear-resistant jacket.

5. Hole Probe — Eberline instrument type containing an Amperex 90NB halogen-quenched counter tube of permanent sensitivity and unlimited life. Sealed to withstand 250-lb. pressures.

6. Power — Vibrator type that may be plugged into automobile cigar lighter or clipped to "A" battery.

A COMPOSITE AND ECONOMICAL INSTRUMENT



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Built Big for Big Hauls

EXTRA RUGGED FOR ALL ROCK AND ORE MOVING JOBS

These rugged movers are built big *all* over! Ton for ton, Kenworth end-dump trucks have greater strength for longer life and less maintenance. Engineered for more driver comfort, safety and control, these production builders are spring mounted—supply unsurpassed visibility and dime-sized turning radius. Extra rugged, their variable section frames are designed to provide deepest sections at points of greatest loading stress. Front axles are just plain big—you can't bend them! Kenworth designed, full floating rear axles are over-sized too.

Built to last—their reinforced, all-welded, box-section-ribbed steel dump bodies hold up in service. Twin, fast-acting telescopic hoists, in combination with load equalizers, provide positive stability. Stem to stern, Kenworth builds 'em big—to deliver maximum performance on the toughest jobs!

KENWORTH 801
12 cu. yds. struck—
14 cu. yds. heaped

18-TON

KENWORTH 802
16 cu. yds. struck—
19 cu. yds. heaped

24-TON

KENWORTH 802B
32 cu. yds. struck

48-TON

KENWORTH 803
24 cu. yds. struck—
28 cu. yds. heaped

36-TON

KENWORTH
MOTOR TRUCKS

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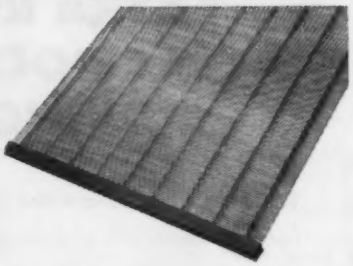
FOR DEWATERING, SCREENING, WASHING, EXTRACTING, FILTERING or SIZING APPLICATIONS

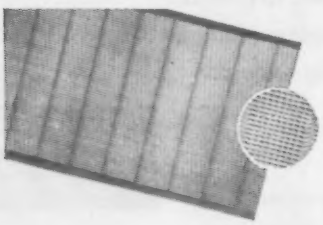
SCREEN GUARDS

A new innovation in the mining and industrial field. Particularly adaptable for use in flumes. The screen guard is built right into the screen and the vertical guard bars keep the larger lumps of material above the guard bars, permitting only the finer particles to pass over the screen. Special sizes can be furnished.



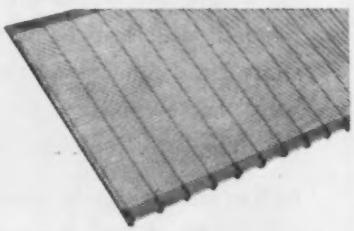
VIBRATOR SCREENS

They can be designed and adapted to fit any make of vibrator. You do not have to change your present machine to accommodate this screen. It is of quality construction and built to give maximum service. The rigid construction and method of installation prevents "whipping".



MARCEL-TYPE SCREENS

This screen is entirely different inasmuch as it is of a Marcel-type construction. It was designed for operations where slivers passing through are objectionable in the end product. This screen can be made in all sizes and shapes wherever applicable to higher and productive efficiencies. It gives long life and non-blinding operation.



ALUMINUM SCREENS

This aluminum screen has all of the attractive and sturdy features of many other metals. In addition, it offers flexing action that adds capacity and dewatering abilities which are almost unbelievable. No changes are necessary in the body of the screen to effect its installation.

NON-BLINDING — NON-CLOGGING - LONGER LIFE - MOST ECONOMICAL

The diagram at left shows all of the efficiency that can be furnished to you by **KLEENSLOT** Wedge Wire Preparation Screens, inasmuch as the wedge construction permits easy clearing. **KLEENSLOT** Wedge Wire Screens can be furnished in practically any type of metal. It costs nothing to obtain a Wedge Wire recommendation free of charge. Complete literature is available for the mining, oil, food, chemical and abrasives industry. There is a **KLEENSLOT** Wedge Wire Screen for every application.

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GAS STREET AND NICKEL PLATE R. R.
WELLINGTON, OHIO

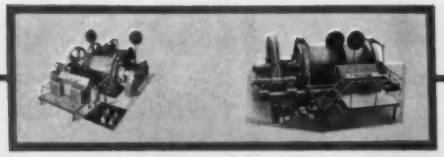
over 65 years of service to mining

Vulcan-Denver

CUSTOM ENGINEERED and STANDARD EQUIPMENT

FEATURES and APPLICATIONS

HEAVY DUTY HOISTS



Custom built for special conditions at 15,000 to 30,000 lbs. rope pull. Radial acting dental clutches; brakes and clutches air or oil operated. Electrical control and safety equipment. For high production use.

LIGHT DUTY HOISTS

Custom engineered to conditions, for installations requiring 1,250 to 15,000 lbs. rope pull. Choice of motive power, safety and electrical equipment. Dental or friction clutches. Air, oil or mechanically operated brakes and clutches.

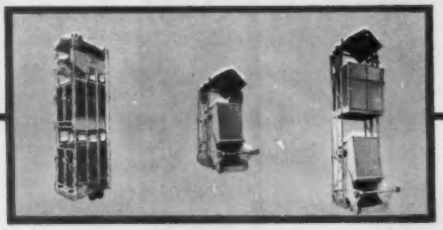
SMALL SLUSHERS

Famous for low maintenance and long life. These rugged little slushers are available in 10 to 75 HP sizes. Ball and Roller Bearing construction, sealed planetary gearing, heat-dissipating clutches. Built to any required production in single, double or triple drum models.

LARGE SLUSHERS

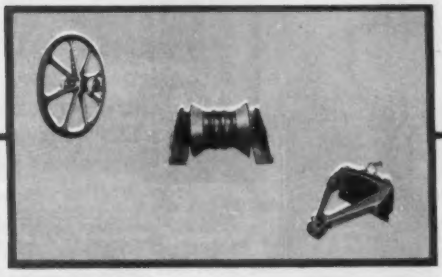
These 100 to 150 HP high capacity slushers are available in single or double drum models. Long used and continually reordered for large tonnage block caving operations. Wide choice in controls and features.

SKIPS and CAGES



Automatic bottom dumping skips are the coming thing. Vulcan vertical, self dumping skips or skip-cage combinations built to your requirements offer maximum strength and safety, high capacity-to-weight ratios. Vulcan cages are safe and easy running, available in various styles.

SHEAVES • ROLLERS • SCRAPERS

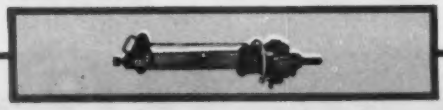


Ball and roller bearing sheave designs with cast steel or Mehanite construction. Grooves flame hardened or with replaceable liners. Low inertia designs for all hoisting service.

Try this slope roller with replaceable rubber segments for heavy service. Cushions rope for longer life. Segment rings also in Neoprene. Alemite lubricated sealed ball bearings.

One-piece scrapers of manganese steel with replaceable liner. Built to match the service of large Vulcan slushers.

AIR & ELEC. CHAIN SAWS



Widely used among larger underground mines. More than double the work capacity of ordinary chain saws. Built for long, trouble free service and easy handling.

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DENVER 2, COLORADO

WORLD FAMOUS for QUALITY and SERVICE

DIAMOND BITS and CORE BARRELS

Trouble-free operation—minimum maintenance—maximum core recovery. This is what you buy in Christensen coring equipment. Equipment designed for every type operation and every size drill, from portable to heavy duty types.

SERIES D-CORE BARREL

Manufactured in AX, BX, NX, size. This barrel comes in 10 ft. and 5 ft. length and takes a core ranging in size from 1.136″ dia. (AX) to 2.060″ dia. (NX). With a full floating inner tube to prevent friction grinding and minimize core wash, this barrel will recover the greatest possible amount of core even in the softer, more fractured formations. Excellent for use with lighter to intermediate weight drills.

SERIES C-2—CORE BARREL

Increased annulus between tubes, between outer tube and hole allows this barrel to be used with either water, air or oil base mud.

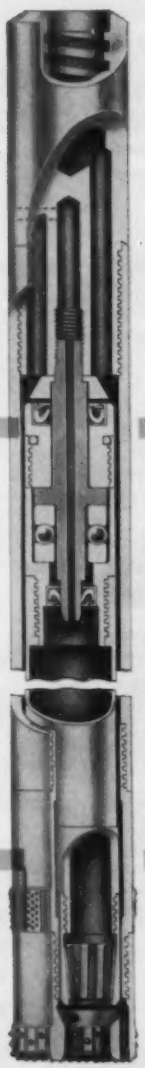
Manufacured with heavy wall tubing, this barrel is recommended for the most severe conditions. The series C-2 barrel is available in AX to NX size; comes in 20, 10, and 5 ft. lengths.*

Core size from 1.067″ dia. (AX) to 1.875″ dia. (NX). NX size is illustrated.

*AX comes in 10 and 5 ft. lengths only.

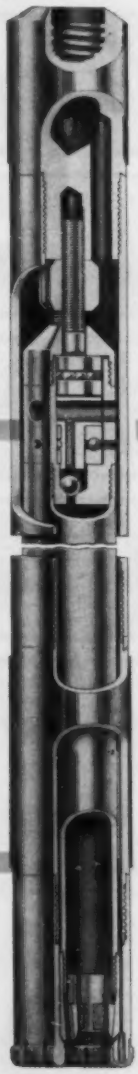
3½″ x 2⅛″ Core Barrel

This barrel, similar to our Series 250P oil field barrels, is made for use with heavy duty drills. It can be used with mud, or air, and takes a 2⅛″ core. Available in 20, 15, 10, or 5 ft. lengths.



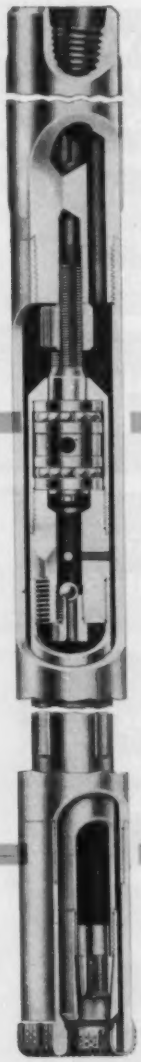
SERIES D

For conventional diamond drill using water. Can be supplied with chrome plated inner tubes.



SERIES C-2 NX SIZE

For conventional diamond drills using air, water, or mud can be supplied with chrome plated inner tubes.



3½″ X 2⅛″

For large rotary drills using mud or air.

For complete prices and sizes on all Christensen Diamond Bits and Core Barrels, write for catalog SD-506.

Less cost per foot...

WORLD FAMOUS for QUALITY and SERVICE

FOR MINING EXPLORATION

Rock differs in drillability from area to area. Although any Christensen bit will perform in any formation, you'll get optimum performance from Christensen bits designed to cut a specific type of rock. The variety of types, means there's a Christensen Bit designed to cut the rock you're drilling at "Less Cost Per Foot." Contact us.

CORE BIT — 3⅛"x1⅞ Type 7328

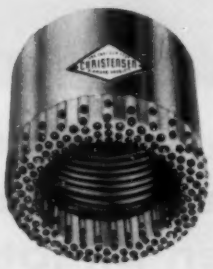
This bit is designed for use with air or mud on Christensen NXC-2 core barrel. Has six waterways, hard matrix, and 48 carats of 3 per carat size diamonds. The oversize O.D. is recommended for air circulation or for use with mud.

CORE BIT—Type 7785

This bit has been used very successfully, using compressed air or mud in drilling sandstone and shale. Has 16 waterways, 60 carats of 4 per carat size diamonds in a hard matrix. Fits Christensen 3½" x 2⅛" core barrel.

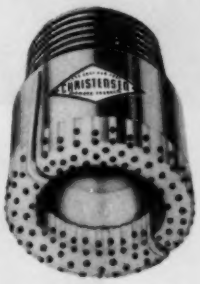
CORE BIT—Type 4746

AX series D Face Discharge Coring Bit, 4 ports, no waterways, extra hard matrix, 25 per carat diamonds, about 11.5 carats. Recommended for maximum core recovery in broken and severely abrasive rock. May be made with waterways and discharge ports.



CORE BIT—Type 2643

EX Bevel Wall Core Bit, 2 reinforced waterways, 40 per carat diamonds, hard matrix. This bit is set with small diamonds and is recommended for moderately abrasive formations.



CORE BIT—Type 1720

AX Bevel Wall Core Bit, hard matrix, 25 per carat diamonds, no waterways, approximately 12.5 carats, used for moderately abrasive rocks, where rock is free cutting, and where maximum diamond concentration is desired.

Christensen Diamond Products also manufacture casing shoes, casing bits, reaming shells, and drilling bits. For complete information, write for catalog SD506.

1937 SOUTH SECOND WEST

SALT LAKE CITY 10, UTAH

CHRISTENSEN DIAMOND PRODUCTS

LESS COST PER FOOT
CHRISTENSEN
DIAMOND PRODUCTS

Stemming material delivered by 2¼-yd. Michigan 175A

Commutes 2 miles between Arizona pits . . .

Versatile Michigan pays for itself on a multitude of open pit jobs

This 2¼-yd. Michigan Tractor Shovel works at one of the biggest open pit copper mines in Arizona. At this location two pits are being mined: one a 4000 x 6000 pit up to 600-ft. deep; the other a new cut two miles away. Between these pits, the 27-mph Michigan commutes on its own power to handle a multitude of jobs.

Cleans up excess ore

Prior to blasting, the Michigan cleans up excess ore around the toes of the benches. It takes less than two minutes to put a heaping load into a 6-yd. dump truck. This efficient clean-up job makes for fuller breakout of material when blasting.

Delivers stemming material

No matter how hard the drillers try to dispose of the mud from the churn-type blast hole drills, trucks are often unable to get through to deliver stemming material. The 4-wheel drive Michigan easily works through the mud, delivers loads of stemming material to the powder loading points to keep shots on schedule.

Cleans up around shovels

When the crawler bulldozers come off the mine floor for repairs, the 133-hp Michigan does the clean-up work around the power shovels. Working on a new addition to the concentrating plant, the Michigan handles sand, aggregate and cement at the concrete plant. The Michigan also built a baseball diamond and part of an air strip by hauling and spreading the necessary material. Its big rubber tires even did the compacting!

A versatile work horse

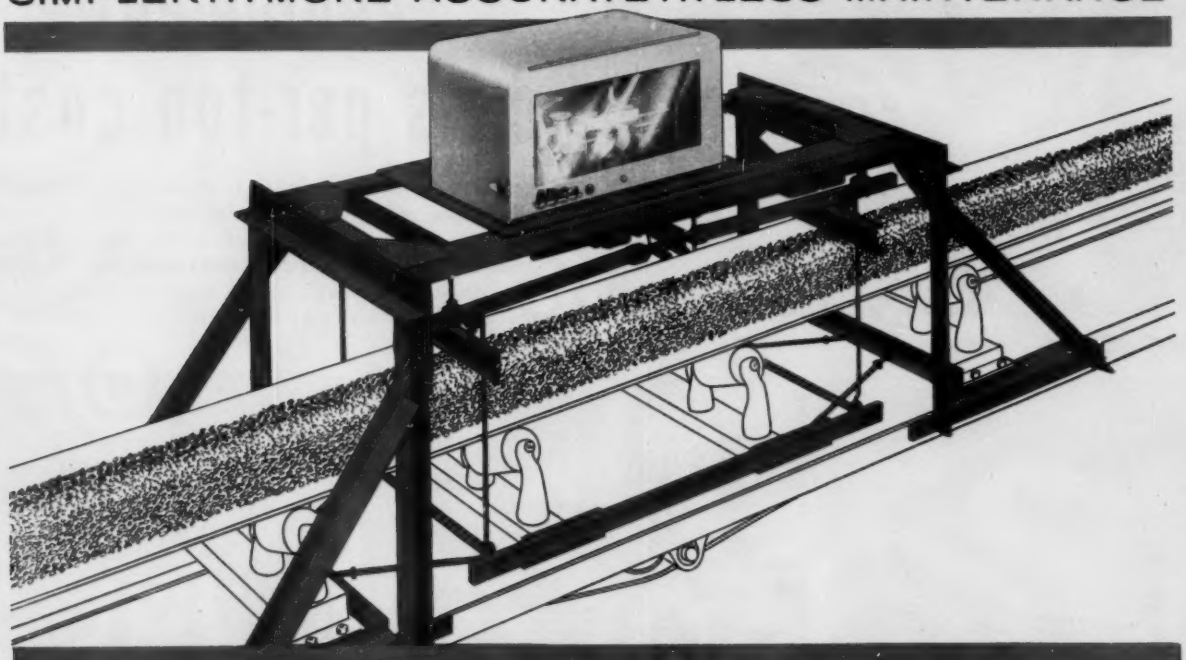
With Clark torque converter, power-shift transmission and planetary-wheel axles, the Michigan Tractor Shovel delivers *more useable power and traction than you've ever seen on this type of machine.* It will handle amazingly heavy jobs—in addition to the routine assignments which affect the performance of the more expensive equipment, like power shovels, drills and rolling stock. For proof that the Michigan is in a class by itself, ask for an on-the-job demonstration. *You name the job.*

CLARK EQUIPMENT COMPANY
Construction Machinery Division
2493 Pipestone Road
Benton Harbor 23, Michigan

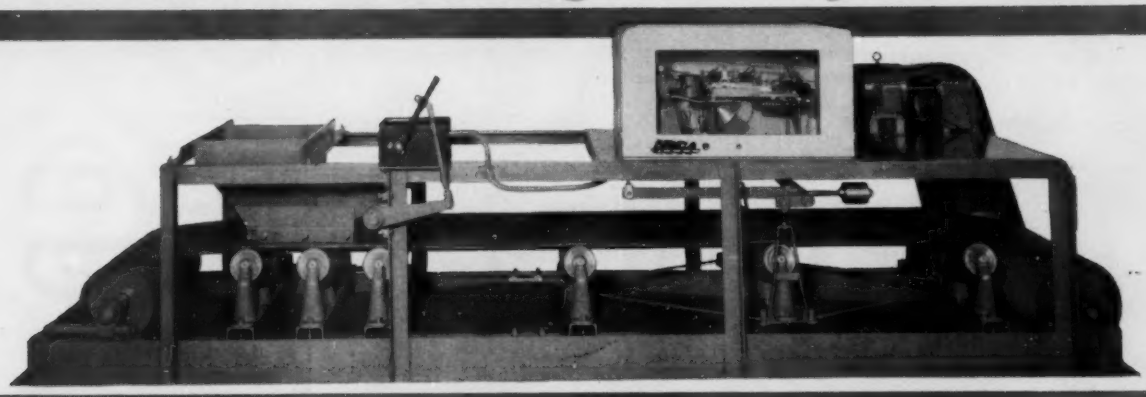
Michigan is a registered trade mark of

CLARK® EQUIPMENT

SIMPLER... MORE ACCURATE... LESS MAINTENANCE



Accurate Blending Conveyor Scales



and Feeders

Completely redesigned on the basis of exhaustive field surveys and laboratory tests, ABCs Scales and Feeders offer the mining and minerals processing industries unparalleled advantages in simplicity of operation, rugged construction, and consistent accuracy. Extra dividend: ABCs engineering and application savvy, the result of extensive experience in complete automatic blending and proportioning systems now in use by many satisfied customers. Agents in all principal mining centers.

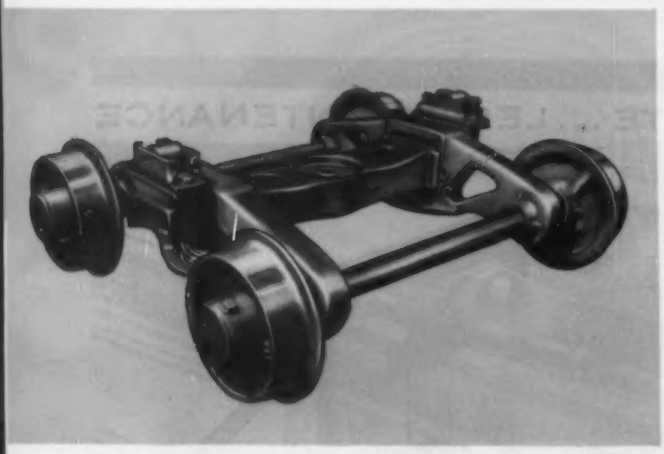
Write for Bulletin 100

1560-ABC

ABC's

BELT SCALES AND FEEDERS

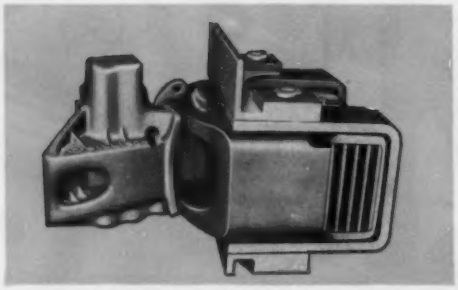
ABCs SCALE DIVISION
McDOWELL COMPANY, INC.
16360 Waterloo Road • Cleveland 10, Ohio



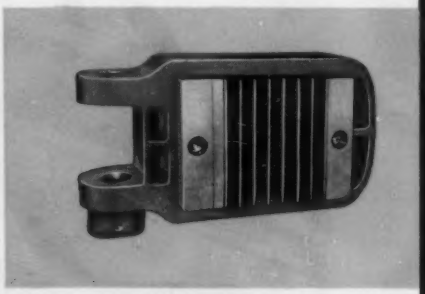
NATIONAL equipment cuts per-ton costs

NC-1 MINE CAR TRUCK is the latest example of National's pioneering in better equipment. Among NC-1 truck advantages are longer and softer ride springs, friction damping mechanism that controls vertical and transverse oscillations, automatic frame alignment and cast one-piece bolster with large lubricated center bearing. A-9021

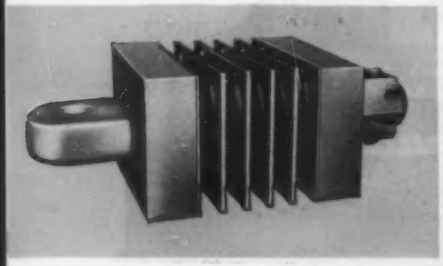
WILLISON AUTOMATIC COUPLERS save time with maximum safety, couple at either end of car or locomotive, require no manual assistance, eliminate damaging slack, permit high speeds with maximum stability.



NATIONAL MI-235 Rubber-Cushioned Draft Gear primarily used in Willison spherical-horn coupler assemblies for drop-bottom cars and locomotives; are effective with link and pin bumpers and in strap yokes.

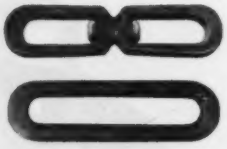


NATIONAL MI-225 Rubber-Cushioned Draft Gear for locomotives and large capacity cars not required to operate through rotary dump. Give maximum impact protection in minimum space.



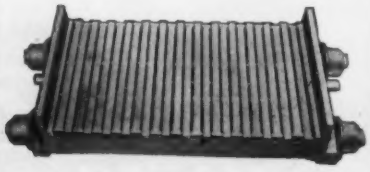
NATIONAL MI-230 Rubber-Cushioned Draft Gear for cars in rotary dump service. High-capacity rubber pads with soft initial action provide maximum impact protection, lengthen equipment life. Available in capacities and designs to fit individual requirements.

NACO STEEL WHEELS, made from quality-controlled Naco cast steel—of high yield point, great tensile strength and ductility—reduce tread spalling or flange breaking. Available in all sizes regularly used in mining or industrial operations.



NACO STEEL SWIVEL HITCHING AND LINK

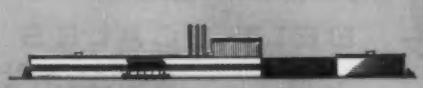
CAST ALLOY STEEL ORE-GRINDING BALLS



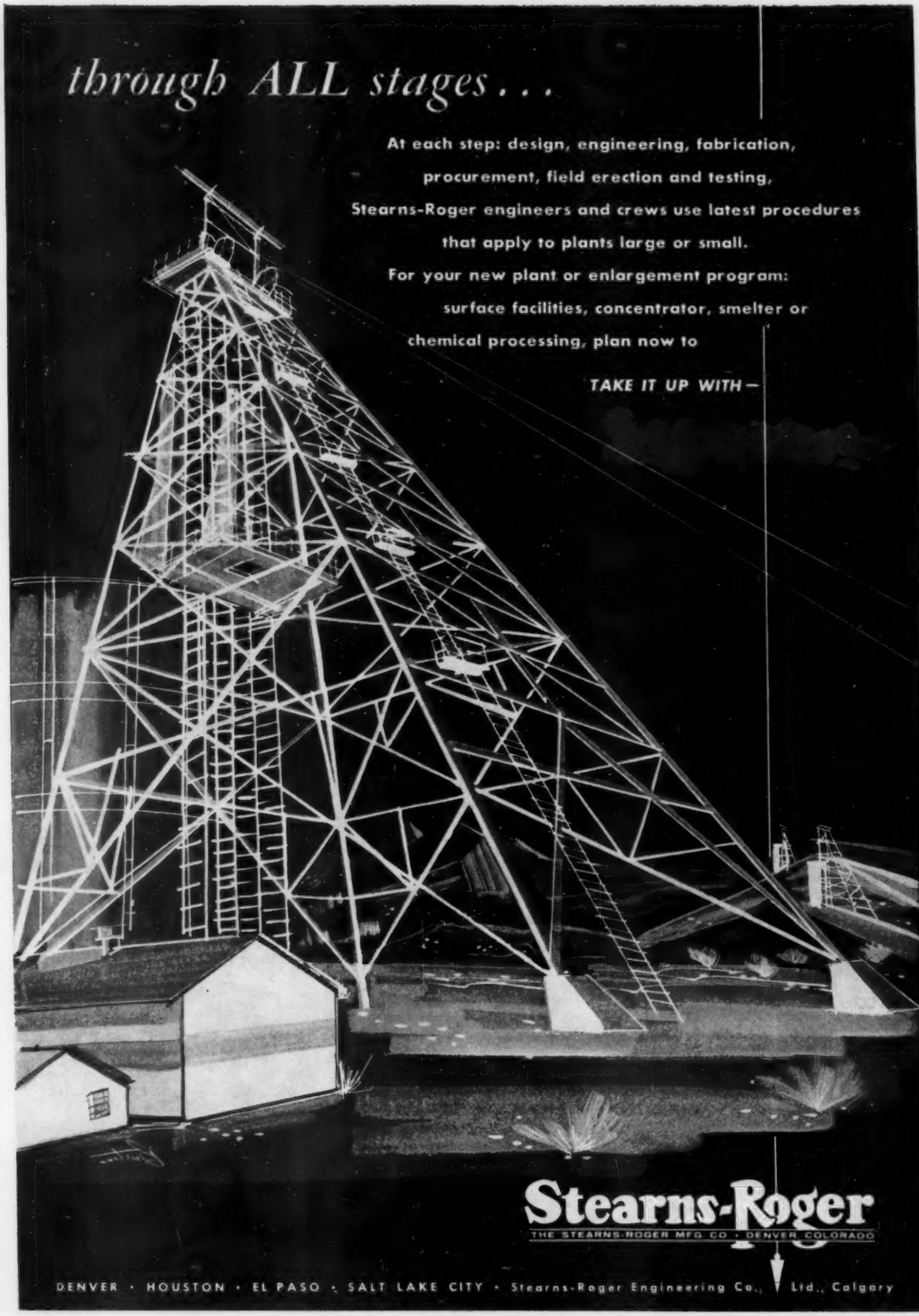
CAST STEEL PALLET AND MALLIX SINTERING BARS

NATIONAL MALLEABLE AND STEEL CASTINGS COMPANY • Cleveland 6, Ohio

Technical Center



"Progress through Research"


through ALL stages . . .
At each step: design, engineering, fabrication,
procurement, field erection and testing,
Stearns-Roger engineers and crews use latest procedures
that apply to plants large or small.
For your new plant or enlargement program:
surface facilities, concentrator, smelter or
chemical processing, plan now to
TAKE IT UP WITH—
Stearns-Roger
THE STEARNS-ROGER MFG. CO. • DENVER, COLORADO
DENVER • HOUSTON • EL PASO • SALT LAKE CITY • Stearns-Roger Engineering Co., Ltd., Calgary

MARTINDALE ELECTRIC CO.

1332 HIRD AVENUE • CLEVELAND 7, OHIO

MICA UNDERCUTTERS

—9 MODELS—
6 Portable
3 Stationary
Electric or Air-Motor Driven

"Mica-Miller" (illustrated) is a powerful Light-weight, low-cost easy to use Undercutter, operating from 1/5 H.P. Universal motor. Available with small, medium or heavy-duty head (interchangeable).

MICA SAWS AND CUTTERS

Martindale manufactures a complete line of Undercutter Saws and "V"-cutters. Both types are available in high speed steel; saws only, in tungsten carbide. Large stocks are carried for immediate shipment.

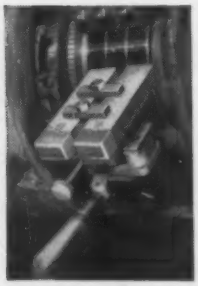
COMMSTONES

Five grades for resurfacing commutators and brass or copper slip-rings. Three grades for cast iron and steel slip-rings. Sizes and handle styles for all needs.

COMMUTATOR GRINDERS

New and improved grinders for truing commutators and slip-rings make the job more accurate, faster and easier. Models to handle commutators up to 50 in. long without dismantling the machine.

COMMSTONE HOLDER



Holds Commstones rigid and true for concentric resurfacing of commutators and slip-rings while running at normal speeds. Grinds commutators up to 4¾" wide. Used with two Commstones in stone holder or one Commstone in 2" box.

GROWLERS

Five types. Bench Type (B-1) illustrated. Portable types can be used both as external growlers for armatures, internal growlers for stators.

BEARING TOOLS

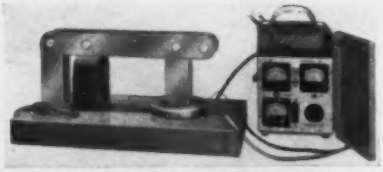
No. 1 Set above is used to insert or extract sleeve bearings from motors or other machines—Capacity ½" to 1-1/16". Set includes two bearing supports for different motor frames, 10 different taps, and Fan Motor Attach. for bearings less than ½".

No. 2 Set available for larger bearings.

V.A.O. TESTER—Model 455

This greatly improved and more versatile Tester has as its outstanding advancement a *patented automatic overload protection system.* You can't burn it out. Six testing ranges: Volts, AC and DC: 0-3, 0-12, 0-30, 0-120, 0-600, 0-1200; Amperes, DC only: 0-10; Ohms: 0-1000, 0-100,000; Megohms: 0-1, 0-100; Also 4 Milliamp and 1 Microamp range. Test leads furnished; carrying case available.

COIL TESTER MODEL 55



Detects shorts and opens. Shows number of turns in a coil from 10 to over 3000 turns. Specifications and prices in Catalog No. 30.

WHEEL AND GEAR PULLER

Adjustable arms pull straight without squeezing the work. Set screws prevent spreading. Made in 2 styles and 4 sizes up to 24" diam.

MOTOR-FLEX UNITS

flexible-shaft grinders for grinding, buffing, polishing, etc.

Martindale Motor-Flex Units are made in 7 Models, 24 combinations. From 1/10 to 1/2 H.P. with various motor speeds. Used with special heads for mica-undercutting, armature slot cleaning. Complete line of attachments. Write for details.

HAND TACHOMETER

Has speed range of 60 to 24,000 R.P.M. in 5 steps. Can be used in any position, is unaffected by direction of rotation, by magnetic lines, or by temperature changes. Gives instant speed reading without needle vibration. Has rubber tired wheel for surface speed of belts, fly wheels, etc.

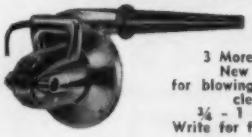
ELECTRIC ETCHERS

4 Models to permanently etch ferrous metal items as easily as writing with a pencil. All 4 have adjustable heat ranges to suit requirements of the job.

DEMAGNETIZER MODEL D-3

This tool quickly and easily removes magnetism from cutting tools such as cutters, drills, saws, etc. and thus keeps them free from chips and metal-slivers that reduce production. Cuts cost of tool maintenance.

PORTABLE ELECTRIC BLOWERS

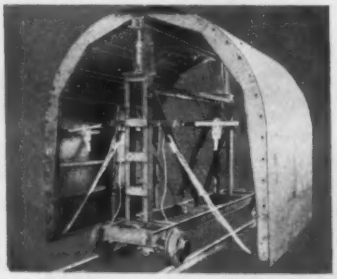


3 More Powerful New Models
for blowing and vacuum cleaning
¾ - 1 - 1½ H.P.
Write for full particulars

DUST MASKS

Weigh less than 2/5 oz. Workers like Martindale Masks because they are light, comfortable, convenient, sanitary, and effective against non-toxic dusts. List Prices: Masks $ 30 ea. #1 Refills $.02 ea. Quantity Discounts for $10.00 list and over.

WRITE FOR COMPLETE 64-PAGE CATALOG.



MAYO TELESCOPIC STEEL DRIFT FORM built for the main haulage tunnel, 10′ x 11′, of an important Pennsylvania iron mine. Other Mayo steel forms, designed for specific jobs in other parts of the world, include: telescopic, non-telescopic, separate sidewall and arch, single unit, full round forms for monolithic pours, etc.

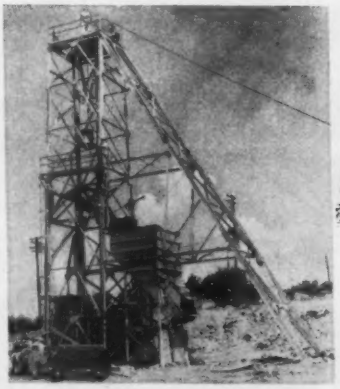
YOU CAN DEPEND ON MAYO

TUNNEL and MINE EQUIPMENT

. . . based on over 25 years of specialized design and construction experience

. . . proved in use in every part of the world. For more complete information, send for FREE, 8-PAGE BULLETIN NO. 22

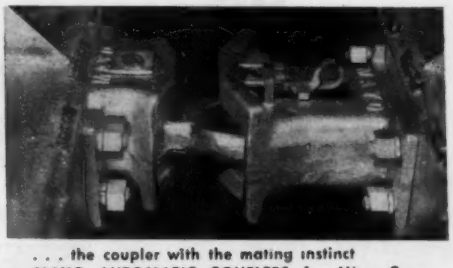
SPECIAL EQUIPMENT DEVELOPED FOR SPECIAL PROBLEMS



MAYO HEAD FRAMES—for deep or shallow shafts. MAYO SINKING FRAMES—for quick erection and dismantling. Each designed and built for specific installations. Depend on Mayo's world-wide experience to provide the most practical answer to your problem.

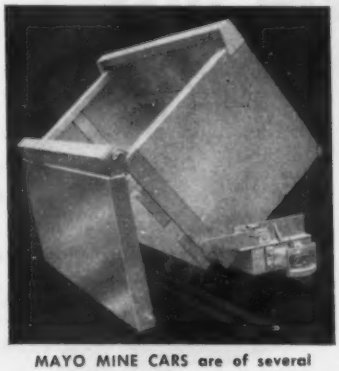
MAYO CAR PASSERS require only one man to operate, two to carry. Low in first cost, they're safe and efficient in use.

MAYO PNEUMATIC GROUTERS have proved dependable, efficient machines for placing low pressure grout in tunnels, mines, shafts and sub-grades. Readily convertible for shooting Pea or Birds-Eye gravel. Always kept in stock for immediate shipment.



. . . the coupler with the mating instinct

MAYO AUTOMATIC COUPLERS for Mine Cars couple instantly on tangent or curves. Safe, self-centering link completely eliminates all hazards of hand coupling . . . more than pays for itself by preventing accidents. Easily bolted to existing cars.



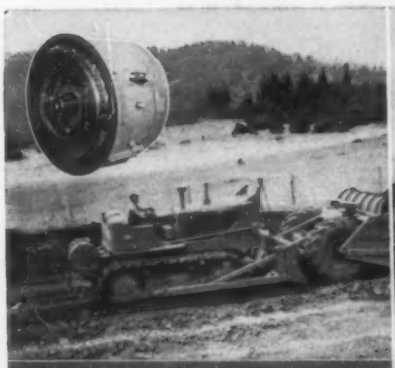
MAYO MINE CARS are of several types. Illustrated is a 2½ cu. yd. Side Dump Car, 24" gage of the Granby type. Rocker Dump cars also available. All Mayo cars can be equipped with the Mayo automatic coupler.

MAYO

TUNNEL and MINE EQUIPMENT

LANCASTER, PA., U.S.A.

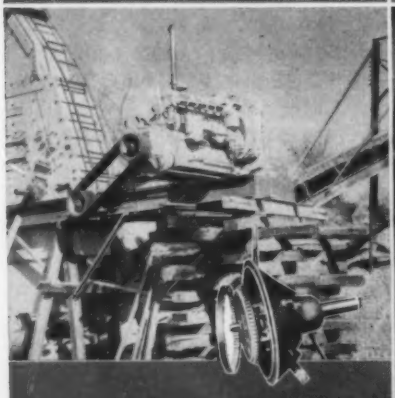
- Skips and Cages
- Kibbles and Gilleys
- Drill Jumbos
- Air Locks
- Tunnel Shields
- Mine Locomotives



CRAWLER TORQUE CONVERTER

FLUID POWER TAKE-OFF

TRUCK-TYPE TORQUE CONVERTER



FRICTION POWER TAKE-OFF

FLUID COUPLING

CL FRICTION CLUTCH

Wherever you find ORE... you also will find TWIN DISC

In mining—wherever power is applied to driven equipment—you're likely to find Twin Disc Friction Clutches or Fluid Drives.

In removing overburden, you'll find the biggest crawler tractors driving through Twin Disc Torque Converters . . . power shovels, equipped with either Twin Disc Converters or Fluid Power Take-Offs . . . and trucks incorporating Twin Disc Truck-Type Torque Converters.

In removing and processing ore, you'll find stationary power units equipped with rugged Twin Disc Friction Power Take-Offs . . . conveyor systems, receiving a *shock-cushioning* flow of power through Twin Disc Fluid Couplings . . . and drills, equipped with Twin Disc Model CL or EH Friction Clutches.

Today, Twin Disc is the world's largest exclusive manufacturer of a complete line of friction and fluid drives—for correctly linking horsepower to industrial powered equipment. Since 1918, Twin Disc *specialists* have designed and built friction and fluid drives *for that one purpose.*

If *you* have a power transmission headache—consult the Twin Disc Clutch Company, Racine, Wis., Hydraulic Division, Rockford, Ill.

TWIN DISC

TWIN DISC

Friction Clutches and Fluid Drives

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division) Rockford, Illinois

MORRIS MACHINE WORKS

BALDWINSVILLE, N.Y.

Builders of Centrifugal Pumps and Hydraulic Dredges Since 1864

Baltimore, Md.
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Chattanooga, Tenn.
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Kansas City, Mo.
Los Angeles, Calif.
Mulberry, Fla.
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Newtonville, Mass.
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Syracuse, N. Y.
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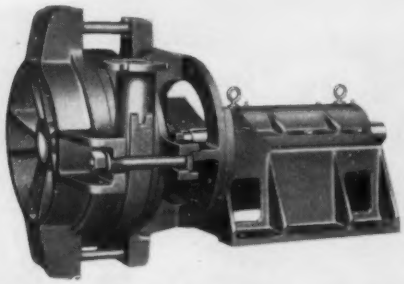
Canada: Taylor Engineering Construction Co., Toronto; Watson-Jack-Hopkins, Ltd., Montreal; A. B. Wing, Vancouver, B. C.

Export Office: 50 Church St., New York 7, N. Y.

- ***Ideal for Flotation Mill Service***

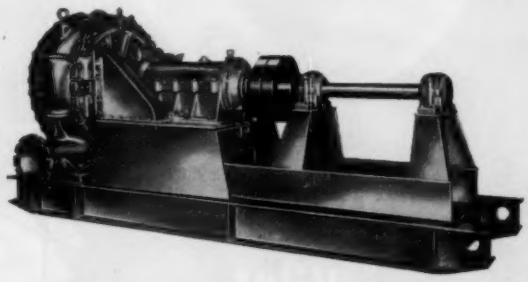


MORRIS type "RX" SLURRY PUMP

. . . for continuous 24-hour pumping of Ore Slurries, Tailings, Concentrates, Abrasive Mixtures

- **Simple design.** No internal studs or bolts—no troublesome internal joints and fits.
- **Easily dismantled.** Impeller and shaft sleeve reached simply by removing 4 external bolts.
- **Abrasive resistant.** Casing furnished in large variety of wear-resistant materials.
- **Large hydraulic passages.** Permit low velocities, minimizing wear and frequency of renewals.
- **Drive-side suction.** Stuffing box troubles practically eliminated under conditions of high suction pressure, high vacuum or high suction lift.

Widely used in both metallic and non-metallic mines and mills. Sizes 2" to 8". Write for Bulletin No. 185.



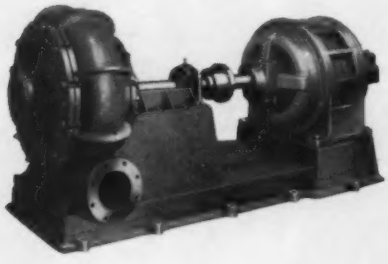
MORRIS types "GA" and "GAF" HEAVY DUTY DREDGE PUMPS

Small high speed or large low speed units for pumping abrasives against high heads

- **Giant shaft.** of high-grade steel withstands vibration, handles shock loads easily.
- **Suction opening** is larger than discharge for handling higher percentage of solids at greater depths without excessive vacuum on suction.
- **Oversize antifriction bearing assembly.**
- **Economical impeller design.** With external cleaning vanes on both sides. Enlarged suction shroud seals on nose.
- **Heavy volute casing** with extra heavy sections at points of maximum wear. Discs covered with heavy renewable liners . . . openings are of same size for right or left hand assembly

Wearing parts furnished in special alloys. Sizes: 6" to 36". Send for Bulletin No. 184.

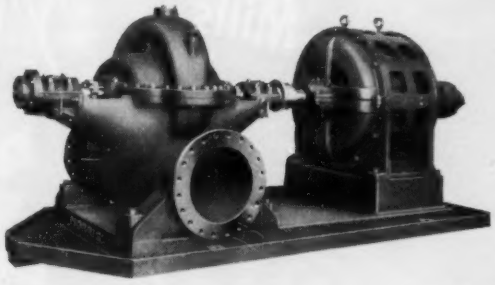
MORRIS



MORRIS type "M" Material Handling Pump

The Standard Pump in Many Mines for Coal Cleaning

- **Low speed, wide clearance** for continuous low-wear non-clog solids pumping at lower cost.
- **With heads of 120' or less,** will handle solids ranging from fine abrasives to pieces of 11" diameter.
- **Most important wearing parts** receive least wear, are subdivided for easy replacement of parts where greatest erosion occurs
- **High mechanical and hydraulic efficiencies** are maintained throughout longer service period.



MORRIS Double-Suction Horizontally-Split Centrifugal Pump

For Drainage and General Service

- **Floating Sealing Rings** adjust concentrically to impeller speeds.
- **Extra-heavy shaft** of tough, hard alloy steel.
- **Upper part** of horizontally-split casing easily removed without disturbing suction or discharge piping.
- **Heavy-duty, precision ball bearings** mounted in dust- and moisture-proof housings.

May be connected in series for higher heads. Sizes: 2" to 220". Send for Bulletin No. 179.

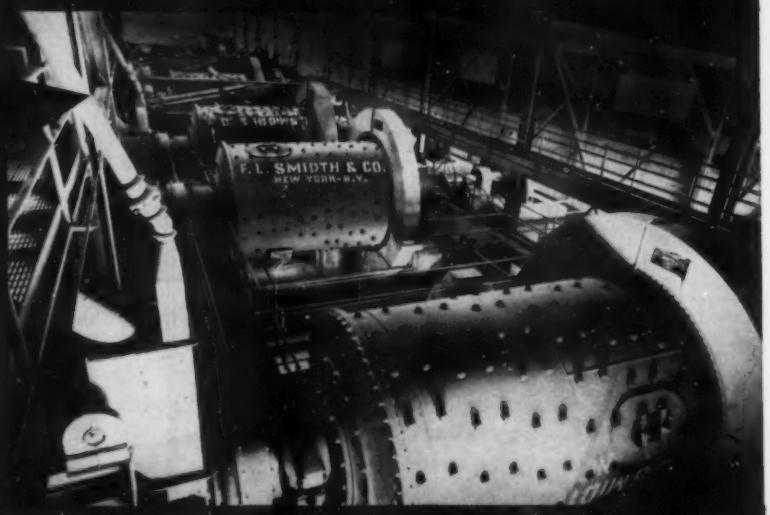
SMIDTH

Rotary Kilns

For sintering, nodulizing, calcining, desulphurizing, oxidizing and reducing roasting—coolers, precoolers, preheaters, recuperators—and auxiliary equipment.

Grinding Mills

Ball mills, tube mills and multicompartment mills—open or closed circuit—wet or dry grinding also airswept for grinding and drying.



Over 1,000 Smidth Rotary Kilns and over 5,000 Grinding Mills supplied all over the world.

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higher production at lower costs

BIN VIBRATORS

Keep coal and ores flowing freely through bins, hoppers and chutes by controlled electromagnetic vibrations. Fast, powerful, dependable. Sizes for 1 cubic foot hopper to large bunkers.

VIBRATORY FEEDERS

Feed bulk materials to screens, conveyors, crushers, picking tables and other processing equipment at controllable rates to meet operation capacities. Available in flat pan or tubular trough models with capacities to 1,000 tons per hour.

VIBRATING SCREENS

Their 3600 controllable vibrations per minute provide fast, low cost, effective screening of coal and ores to processing equipment. Replaceable screening surfaces.

SYNTRON

EQUIPMENT for the MINING INDUSTRY

Equipment of proven dependable quality

POWER CONVERSION UNITS

Low cost a-c to d-c power conversion in one package. Save floor space—eliminate costly maintenance. Contain heavy duty selenium rectifiers. Automatic voltage regulation.

MECHANICAL SHAFT SEALS

Self-lubricating mechanical seals provide a positive sealing of liquids and gases around rotating shafts of pumps agitators, etc. Corrosion resistant. Low maintenance.

TEST SIEVE SHAKERS

Provide a fast accurate uniform sizing of test materials. Equipped for accurate time testing.

GASOLINE HAMMER ROCK DRILLS

Gasoline operated—completely self-contained—easily portable. Automatic rotation of drill steels. Drills at rate of 2 feet per minute. Blows holes clean 13 feet deep.

Write for complete catalog data — FREE

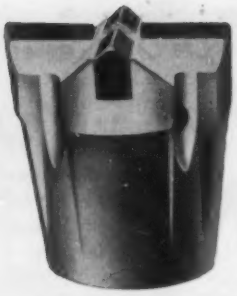
SYNTRON COMPANY

166 Lexington Avenue Homer City, Penna.

Builders of Quality Equipment for more than a Quarter-Century

SYNTRON since 1921

CARSET JACKBITS

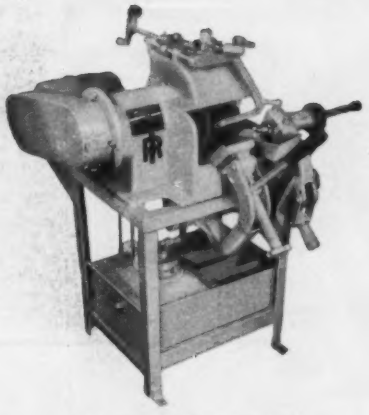


are PRECISION MADE

for HIGHEST PERFORMANCE

Maintain That Performance
by resharpening with
the NEW JC-3 JACKBIT GRINDER

- ▲ Grinds cutting faces to precisely correct profile for maximum drilling efficiency.
- ▲ Grinds bit gage to proper clearance.
- ▲ Eliminates waste of over-grinding.
- ▲ Greatly multiplies operator output.
- ▲ Available with electric, air or gasoline engine drive.



JC-3 Electric Drive Grinder

TO MAINTAIN the unequalled drilling speed of a NEW Ingersoll-Rand Carset Jackbit—and get maximum feet of hole from each bit — resharpening should be done to close tolerances and without unnecessary waste of the cutting material.

All of these requirements are met to excellent advantage with the new JC-3 Jackbit grinder — far more quickly, easily and accurately than by hand grinding methods. Ask your I-R representative for complete information on this time-saving, cost-saving machine. Or send for a copy of Bulletin 4187.

Ingersoll-Rand

11 Broadway, New York 4, N. Y.

COMPRESSORS • TURBO-BLOWERS • ROCK DRILLS
AIR TOOLS • CENTRIFUGAL PUMPS • CONDENSERS
GAS AND DIESEL ENGINES

15-518

Exide®-IRONCLAD BATTERIES—

speed hauling, reduce costs

Want to cut your mine vehicle operating costs—boost productivity? Install Exide-Ironclad Batteries. These heavy-duty units give you that extra reserve of power that lets you make more trips per shift, get more production per man-hour, haul as much the last hour as the first. And because of their proven long life, even in the most severe service, they effectively reduce the cost of your battery power.

Make sure you are getting the maximum possible utility from your mine vehicles. Specify Exide-Ironclad Batteries. Available in a range of sizes to cover the requirements of every application.

EXCLUSIVE EXIDE-IRONCLAD ADVANTAGES:

Tubular construction of the positive plates is unique with Exide-Ironclad Batteries. Here's what this exclusive feature means to you:

⅓ greater effective plate area—power to spare for peak loads as well as a dependable source of power for continuous loads.

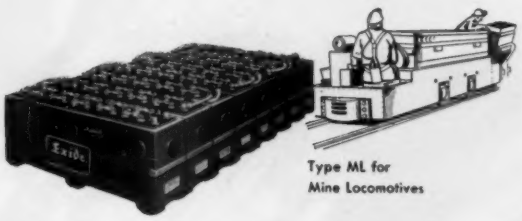
Longer plate life—active material is held firmly captive inside cylindrical power tubes, maintains electrical contact, can't shear off during cycling.

Pools of electrolyte next to plates—speed response to heavy load demands, insure maximum power from battery at all times, without delay.

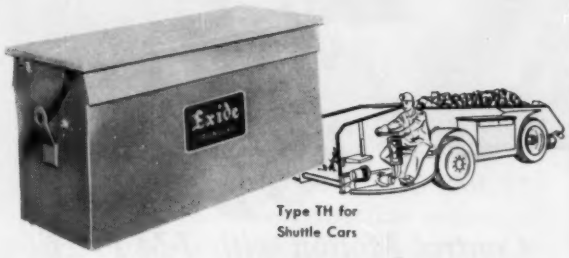
Silvium grids—exclusive patented Exide grid alloy resists corrosion, prolongs strength and thickness of grids, stretches battery life.

Vibration resistant—active material protected from shedding by cylindrical tubes, tiny openings let electrolyte in but keep active material from falling out; battery lasts longer in high vibration applications.

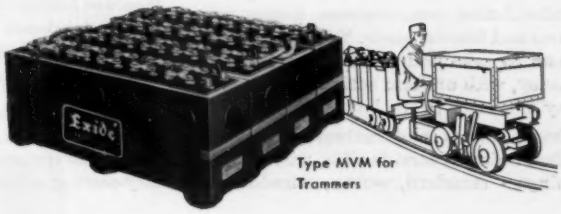
More active oxides—increase battery capacity, give Exide-Ironclad Batteries more power per pound; hence they have greater electrical efficiency.



Type ML for
Mine Locomotives

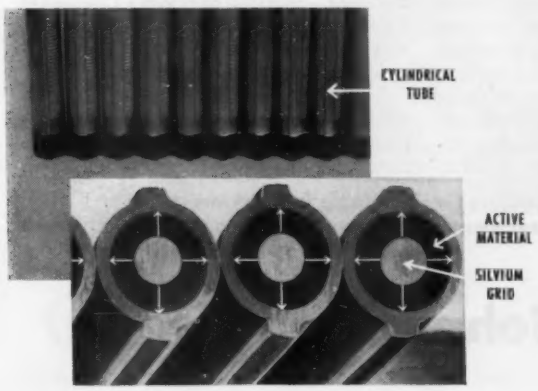


Type TH for
Shuttle Cars



Type MVM for
Trammers

Exclusive tubular construction of the Exide-Ironclad positive plate



For prices, specifications or free manual on maintaining motive power batteries, call or write the Exide sales office near you.

ATLANTA 10, GA.	1246 Allene Ave., S.W.
BOSTON 34, MASS.	100 Ashford Street
CHICAGO 9, ILL.	5335 S. Western Blvd.
CLEVELAND 14, OHIO	1014 Engineers Bldg.
DALLAS 1, TEX.	2133 McKinney Avenue
DETROIT 4, MICH.	8051 W. Chicago Blvd.
KANSAS CITY 23, MO.	129 S. Belmont Blvd.
LOS ANGELES 15, CALIF.	1043 S. Grand Avenue
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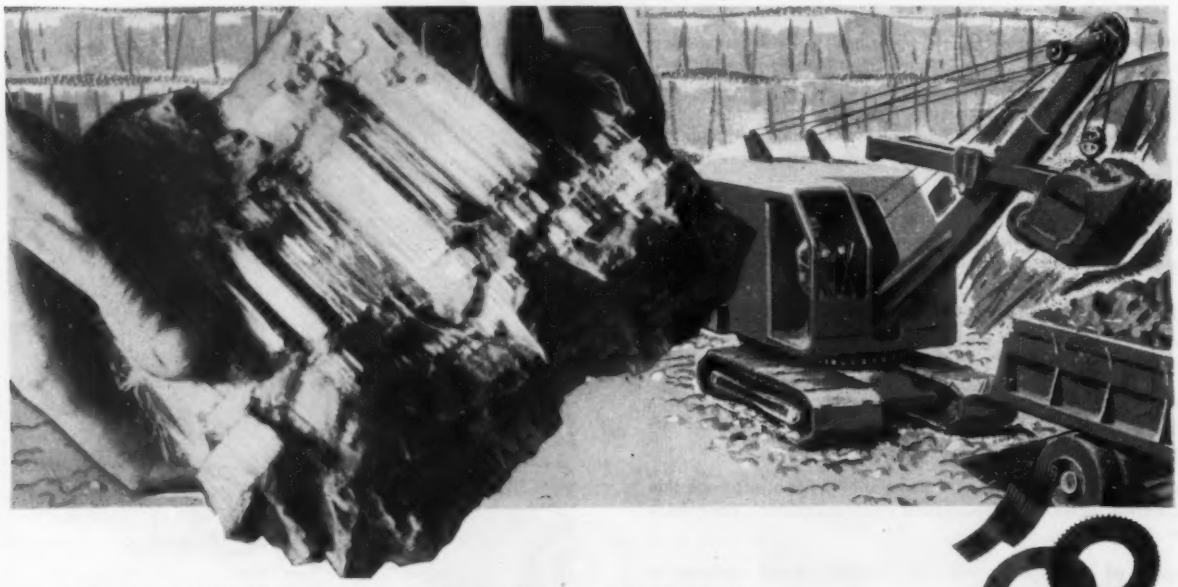
From ASBESTOS come the unique properties

which bring long life and cost-cutting advantages to these J-M products

Through years of research and mining experience, Johns-Manville has developed mining materials that provide rugged, dependable service under adverse operating conditions. Many of these products contain Asbestos for heat resistance, strength and incombustibility. That's why so many mining men rely on J-M friction and packing materials for the smooth, satisfactory performance of their equipment.



Control Motion with J-M Friction Materials

Furnished rigid or flexible for specific mining needs, J-M Friction Materials provide stabilized friction for longer periods under hotter temperatures, higher pressures and heavier loads. You can count on them to save you replacement time and money, with uniform action from the first day of service to the last.

Woven Linings and Facings — single-ply fabric linings • semi-flexible, wire-inserted linings • standard, woven, wire-inserted facings • high-temperature, compacted, resin-impregnated linings.

Moulded Linings and Facings — high-heat, moulded asbesto-metallic facings • long life, rigid moulded linings containing metal and friction particles.

Friction Blocks—durable, medium-friction, asbestos-metallic blocks moulded under high pressure and heat • high-friction, easy-seating asbesto-metallic blocks.

Write for free J-M Friction Materials Booklet FM-35A

Write for Free J-M Packings Catalog PK-3A (Eng) or Int-9A (Sp)

Seal Gases and Liquids with J-M Packings & Gaskets

Over the years, J-M Packings and Gaskets have been constantly improved to meet the increasingly severe demands of mining men. Whether it is for service against corrosive gases, salt water, brine, or other liquids, there's a J-M Packing or Gasket to help maintain higher levels of uninterrupted, trouble-free production.

Packings—moulded packings • Clipper Oil Seals • die-formed rings • asbestos, fabric, and metallic types • platon packing • sheet packing • groove packing.

Gaskets—Kearsarge* Gaskets • flange gaskets • cut gaskets • sheet gaskets • Goetze metal-asbestos gaskets. • gasketing tapes.

Other J-M products for the Mining Industry are:

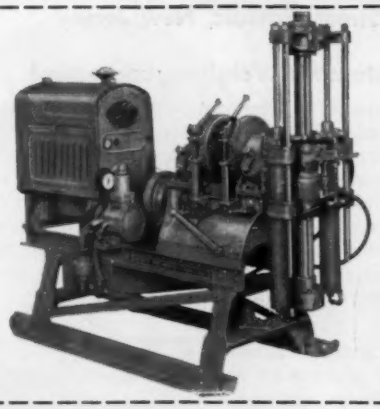
INDUSTRIAL INSULATIONS • REFRACTORIES • ROOFING • CORRUGATED TRANSITE SIDING

Experienced Johns-Manville dealers in principal cities throughout the world will be glad to give you further information on J-M asbestos products for mine service. Write Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

JOHNS-MANVILLE JM PRODUCTS

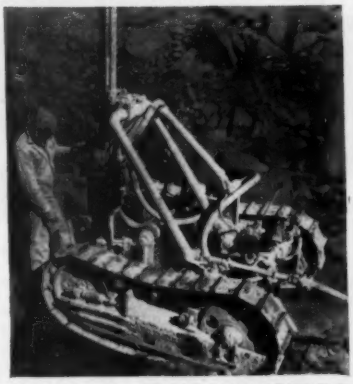
Johns-Manville

EXPLORATORY



Versatile Skid-Mounted CP Core Drills—are also available without skids for truck or jeep mounting. Air, electric, gasoline and diesel drives. Capacities to 2250 feet with E–EX fittings.

OPEN PIT



Self-Propelled G-800 Tracdril — mounts either a hard-hitting 4″ or 4½″ deep hole drill in standard, or standard-neutral-reverse rotation types.
OTHER OPEN PIT EQUIPMENT: Hydraulic Boom Arms (can be mounted on your tractor); CP Rotauger (can be mounted on G-800 Tracdril or tractor for rotary drilling in softer formations).

UNDERGROUND

5 Airleg Models available in *Attachable* types for conversion of standard sinkers to airleg operation and in *Integral* types for production drilling. In feed lengths of 36″ and 48″. OTHER UNDERGROUND EQUIPMENT: CP Rotaugers; Stopers; Drifters, Hand Held Sinkers.

Chicago Pneumatic *8 East 44th Street, New York 17, N. Y.*

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

MERRICK SCALE MFG. COMPANY

180 Autumn Street, Passaic, New Jersey

Specialists in Automatic Weighing Equipment

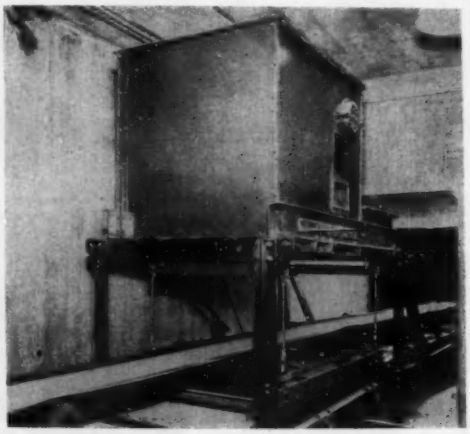
The products of Merrick Scale Mfg. Company, although essentially weighing devices, are designed to function in a much broader capacity in many difficult controlling operations peculiar to the Process Industries.

We have had over 40 years' experience in building equipment to solve such production problems as the weighing of materials in transit, automatic proportioning and batching of materials, weighing of liquids, and accurate totalizing and recording of continuously conveyed material without interruption of process.

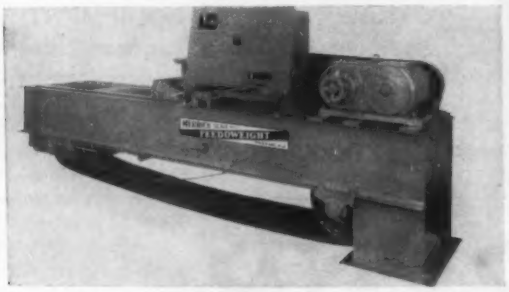
The Weightometer, Feedoweight, and other Merrick weighing devices are carefully engineered for many other useful applications throughout the Industry than can be described on these pages. For complete data on these important items of production equipment, briefly outline your problem and mail it to the above address. Full information and covering literature will be sent to you without obligation.

The Merrick WEIGHTOMETER is a self contained integrating and totalizing conveyor scale for use with an existing belt conveyor of any width and capacity. It combines the principles of a platform scale and mechanical integrator. By utilizing a portion of the Conveyor Belt as the Weighing Platform and mechanically multiplying the weight on the belt by the belt speed through a mechanical integrator, a totalized weight is automatically obtainable in tons, pounds, barrels or other unit of measure per hour on a Master Totalizing Counter.

Any material that can be conveyor handled can be accurately weighed by a Weightometer. Such materials as coal, ore, sand, gravel, fish, fish products, minerals of all kinds, cement, fertilizer, filter cake, wood chips, sludge, etc., are common to the Weightometer. Weighing is accomplished without expense or interruption to conveyor flow. Neither are the services of a Weighman required. Easily installed, simple in operation, durable, automatic and accurate. All working parts are enclosed.

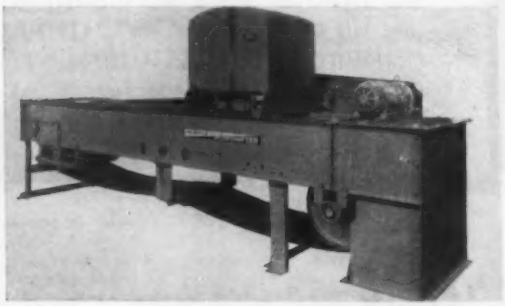


WEIGHTOMETER*



FEEDOWEIGHT*

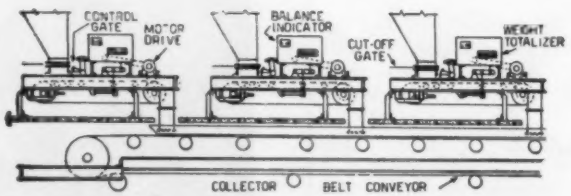
The WSS WEIGHTOMETER is offered for use where a conventional belt conveyor is not available for installation of a standard WEIGHTOMETER. The WSS is supplied complete with its own short belt conveyor, carefully and rigidly constructed to provide good weighing conditions; with motor drive and short supports for easy installation at customer's plant. Usually built with flat belt with moulded flanges along both edges with continuous skirts to prevent side spill of material off the belt during travel and weighing.



WSS WEIGHTOMETER

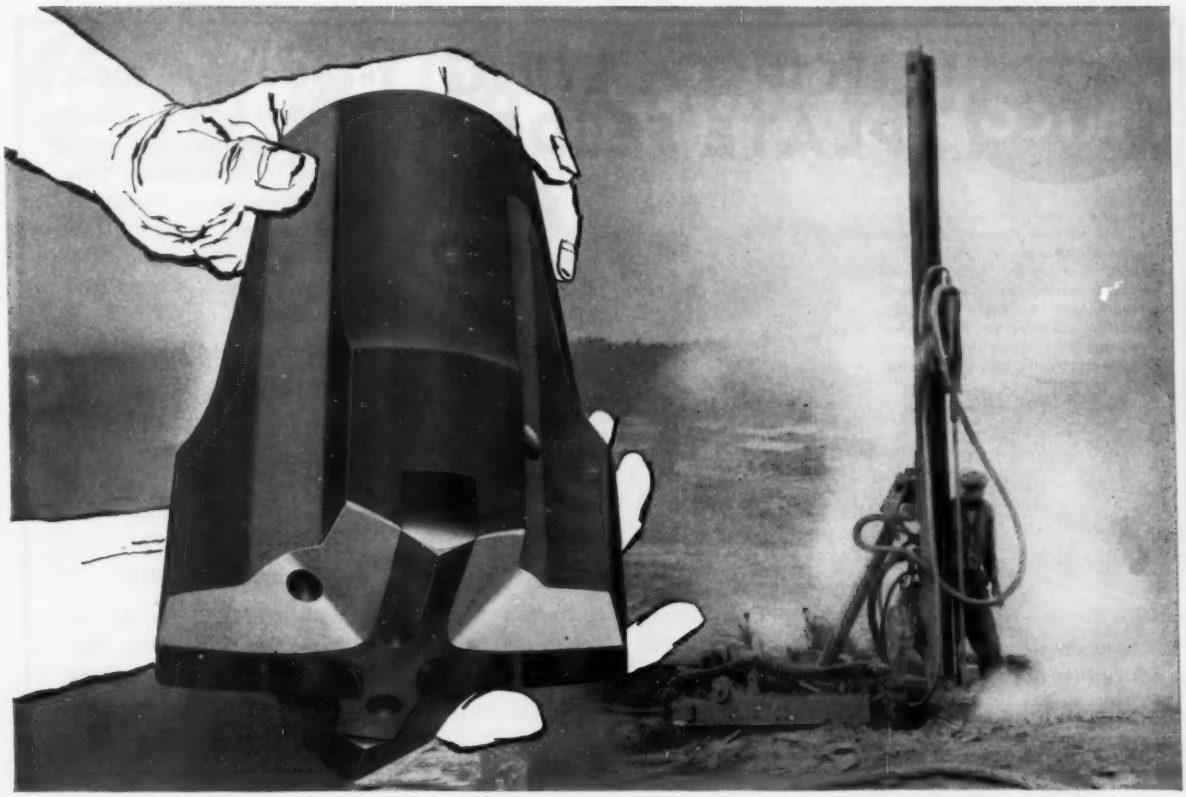
The FEEDOWEIGHT is a dual-purpose machine which correctly and uniformly feeds material by weight and, in addition, automatically totalizes the weight of all materials so fed.

The FEEDOWEIGHT delivers accurate amounts of material according to a predetermined setting, the control being accomplished by means of an automatic gate regulated by a special Powered Feed Regulator rather than by direct connection to scale beam. The scale beam is left free to respond instantaneously to any and all changes of load as it is completely independent of the proportioning mechanism.



The drawing above illustrates an application of three FEEDOWEIGHT units used in a battery arrangement for a proportioning operation. Each unit accurately weighs its own material, automatically controls the rate of feed, and continuously totalizes its weight. Should any hopper become empty, all units in the battery automatically shut down.

* Reg. U.S. Pat. Off.



Kennametal Style PX Rock Bits are available in sizes from 2½" to 5" diameter. The one shown here is a 5" size.

Here is what you get when you use the improved Kennametal* Style PX Rock Bits

Fast penetration . . . long service life . . . minimum maintenance . . . these are benefits you get when you use Kennametal *Style PX* Rock Bits.

The improved "X" design eliminates rifling, provides greater chip clearance and, thus, promotes faster penetration. Alternate long and short carbide insert design puts the carbide where it is needed most, and also speeds penetration. This design permits the use of two off center water ports to improve the removal of cuttings.

Longer bit life in service is provided by three new design features: First, these bits generally have more carbide than other bits of equal size. Second, the long inserts are segmented for greater strength. Third, all inserts are of special grades of carbide that were developed specifically for percussion drilling.

Another feature of this new design is the elimination of the center spacer which is a common source of trouble in drilling operations.

Why not investigate these bits for your drilling problems? A Kennametal representative will gladly help you select the size and grade of Kennametal Rock Bits for each of your operations. Call him or write KENNAMETAL INC., MINING TOOL DIVISION, Bedford, Pennsylvania.

TYPICAL PERFORMANCES

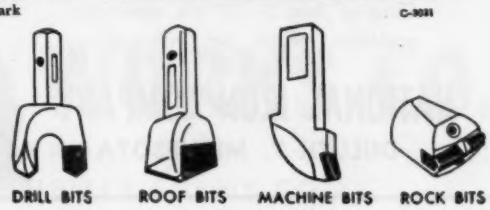
PX-600-3½ and PC-600-3 drilled 150 ft. per regrind (8-10 regrinds per bit) in abrasive Pocono sandstone at speeds of 12" to 14" per minute.

PXK-3½ drilled more than 1000 ft. per bit of hard diabase rock.

*Trademark

C-3011

INDUSTRY AND
KENNAMETAL
...Partners in Progress

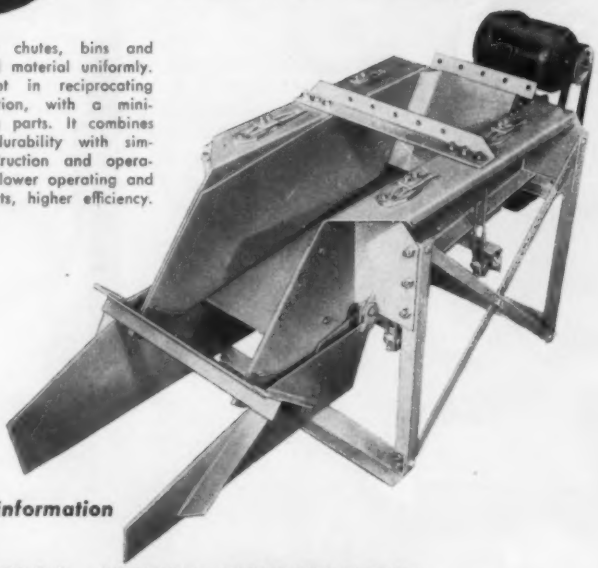


DRILL BITS ROOF BITS MACHINE BITS ROCK BITS

NICO

RECIPROCATING PLATE FEEDER

For use under chutes, bins and hoppers to feed material uniformly. A new concept in reciprocating feeder construction, with a minimum of moving parts. It combines strength and durability with simplicity of construction and operation, to obtain lower operating and maintenance costs, higher efficiency.



For further information write

NATIONAL IRON COMPANY

DULUTH 7, MINNESOTA

The NICO Model 500-C

The NICO Model 500-C employs four doubled flexible steel cables to suspend the reciprocating plate, eliminating the most troublesome parts of ordinary feeders of this type. Cable bending permits the plate to swing freely with no binding or wearing.

- **No rollers to lubricate**
- **No rollers to wear**
- **No track to keep clean**
- **No rollers to replace**
- **No track to wear**
- **No rollers to stick**
- **No track to replace**

The Model 500C cables do not need lubrication or cleaning. They cannot stick, and they last almost indefinitely. They are easily adjustable to change plate height, or angle of inclination of the plate when desired.

ROCKOVER

OPEN PIT SKIP SYSTEMS

- **Will elevate material at a lower cost per ton than any other system.**
- **Handle anything shovels and trucks will handle—no material too abrasive or blocky.**
- **Use only a few trucks in the pit.**
- **Track laid directly on pit wall at angles up to 45°.**
- **Simple extension of track follows deepening of pit.**
- **Load directly from trucks in pit. (See inset photo)**
- **Use multiple loading stations along trackway if desired.**

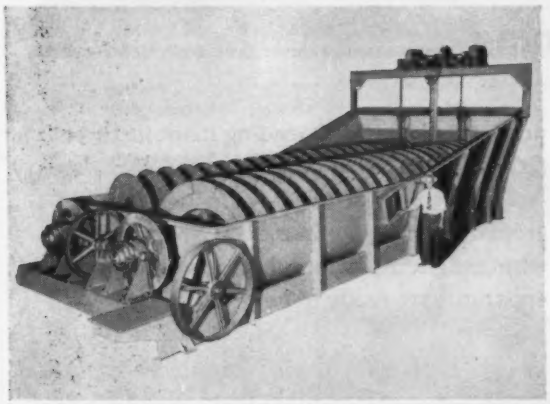
Skips of from 5 - 35 ton capacities available. Write for information.

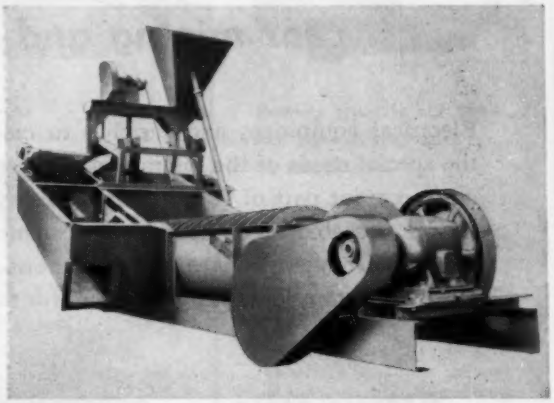
NATIONAL IRON COMPANY

DULUTH 7, MINNESOTA

COST CUTTING EQUIPMENT

AKINS CLASSIFIERS AND HEAVY MEDIA SEPARATORS

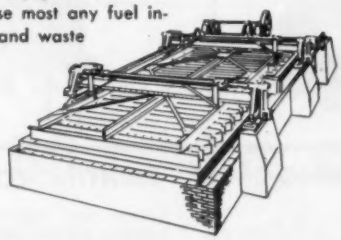




The Akins Classifier was originally developed, in 1908, for use in closed circuit with a ball mill. Its outstanding success led to many other profitable applications where it has demonstrated its superiority... dewatering and recovering fine solids; sand and slime separations; washing coal, sand, and oyster shell; desliming and de-oiling phosphate rock and concentrate; sink-float concentration; and many others. The Akins is made in sizes up to 84", simplex and duplex, in two types—small and large settling pool. The Akins Heavy-Media Separator is the only unit available which can make a 3-product separation in one machine from one medium cleanup circuit.

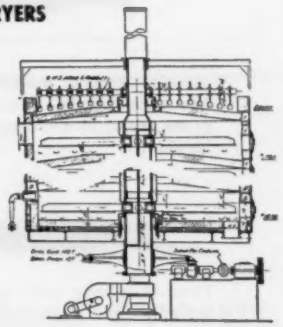
LOWDEN DRYER

For drying flotation concentrates, graphite, clays, ground minerals, paint fillers, pigments, various precipitates. Can use most any fuel including live steam and waste heat.



SKINNER ROASTERS AND DRYERS

For roasting, calcining, and drying ores, clays, limestone, limestone mud, flotation concentrates, decomposing oil sludge in the process of recovering sulphuric acid. Coal, oil or gas fired. Sizes to 23'6" inside diameter; up to 12 hearths.



VEZIN SAMPLER

A continuous sampling device generally used for 5 and 10% cuts on crushed feed. Alloy white iron cutting lip. Rubber or abrasion resistant plate lining inside. Compact direct driven faced tooth bevel gear drive. Easy addition of mixing barrel, operated from same drive.

REPRESENTATIVES

Licensed Manufacturers and Sales Representatives:

Canadian Locomotive Co., Ltd., Kingston, Ont., Canada
John Carruthers & Co. (Pty.), Ltd., Sydney, Australia
Head, Wrightson & Co., Ltd., Stockton-on-Tees, England
Head, Wrightson & Co., S. A. (Pty.), Ltd., Johannesburg

Sales Agents:

Andrews and George Co., Inc., 3 Shiba Park, Tokyo, Japan
Edw. J. Nell Co., Manila, P. I.
Continental Sales and Equipment Co., Hibbing, Minnesota
R. H. Clark Equipment Co., Mulberry, Florida
Mines Engineering and Equipment Co., San Francisco, Calif.

COLORADO IRON WORKS CO.

DENVER, COLORADO

A SUBSIDIARY OF THE MINE & SMELTER SUPPLY CO.

GraybaR...

A complete electrical supply service for mining and refining

Electrical equipment and supplies to meet the special needs of the mining industry are an important part of Graybar's all-inclusive service. Located at or near leading mining centers, Graybar offices and warehouses serve as prompt local supply sources for the products of over 300 leading manufacturers. Graybar Representatives in these areas are well informed on underground or above-ground service requirements. Specialists on wiring, lighting, communication, and power apparatus are ready to help you. 430

ELECTRIC CABLE

GRAYBAR offers a complete line of wire and cable for power distribution, for mining machinery and locomotives, shot firing, signaling, and other specialized needs.

Simplex mining machine cable has tough outer selenium-neoprene armor to stand up in mining service.

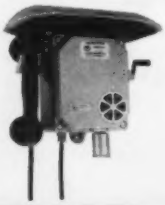
Tirex shot-firing cable combines flexibility and light weight with high strength.

MOTORS, CONTROLS, FANS

General Electric motors and controls, meeting Bureau of Mines or Underwriters Laboratories requirements for hazardous areas, are available via GRAYBAR as a part of our power apparatus service. Ilg ventilating fans and blowers of all types are also available for mine use.

MINE TELEPHONES

U.S.I. Mine Telephones are sound-powered . . . require no batteries or external power supply. They transmit speech clearly over lines of any length. Supplied for either code or selective signaling up to 24 stations. U.S.I. Mine Telephones carry Bureau of Mines Approval No. 905.



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GRAYBAR "Victor" tape is a widely used favorite. Weatherproof sockets, fuses, circuit breakers, panel boards, switches, and terminals are among the many additional wiring supplies distributed by Graybar for electrical systems above ground or below.

LIGHTING EQUIPMENT

Lamps and lighting equipment offered via GRAYBAR include explosion-proof, vaporproof and other specially protected types. Also a full line of floodlights for outdoor service, fluorescents for offices and drafting rooms. Our portables and flashlights are listed by Underwriters Laboratories for Class I, Group D conditions.

Graybar offices and warehouses are located in over 130 principal cities — there's sure to be one near you!

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GraybaR ELECTRIC CO., INC.
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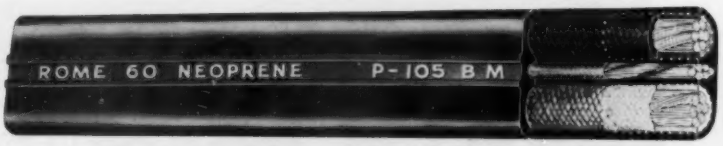
Graybar Everything Electrical

IN OVER 130 PRINCIPAL CITIES

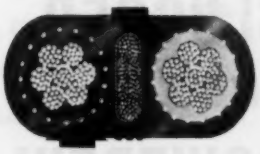


Parallel Duplex (Flat Twin) Mining Machine Cable—600 Volts
(Ungrounded or grounded)

Single-Conductor Locomotive Gathering Cable—600 Volts

Portable Power Cables—Two, Three and Four Conductors
(Ungrounded up to 3,000 Volts, or grounded up to 5,000 Volts)

Three-Conductor Mine Power Feeder Cable
(Shielded with ground wires up to 10,000 Volts)



Rome's shuttle car cable can't be damaged by bending

The rugged Neoprene jacket forms a resilient web between insulated power conductors and ground conductor for maximum impact resistance. The open braid on each conductor firmly interlocks conductors to the sheath as a sturdy integral unit. A greater number of finer strands in power and ground conductors—plus a closely woven fibrous covering around the ground conductor (to minimize mechanical working of the fine strands)—increase over-all flexibility. These two features, together, prevent the damage that constant flexing, twisting, and tension might otherwise cause.

Vulcanized in lead for extra toughness

Rome 60 mining cables are built for rugged duty, both above and below ground

These tough Rome cables have a much longer service life than ordinary cables. This is of dollars-and-cents importance to you because it can mean less down time, reduced replacement expenses, and increased production.

Here are some of the construction features that make Rome 60 cables your best mining cable buy:

Conductors. All conductors are of finely stranded copper wires for maximum flexibility.

Insulation. A long-aging, heat- and moisture-resistant rubber compound permits operation at 75° C., thereby providing overload protection. For high-voltage service, an ozone-resistant insulation is used.

Reinforcements. On Rome 60 portable cables, a heavy reinforcing open braid locks the Neoprene jacket to the inner construction to prevent failure from twisting, pulling, flexing and sheath separation.

Jacket. Neoprene vulcanized in a continuous lead mold provides durability and high resistance to abrasion, acids, oils and flame. All Rome 60 mine-trailing cables are surface-molded "P-105 BM" indicating full compliance with Federal and State of Penn. safety codes.

Specify Rome 60 mining cables for your next job. Contact your nearest Rome Cable representative for more information—or write to Department 176, Rome Cable Corporation, Rome, New York.

ROME CABLE
CORPORATION

LIGHTWEIGHT SLUGGER WITH A POWERFUL PUNCH

PUT THE ▶ *Atlas Copco*

FALCON STOPER *ON YOUR DRILLING TEAM!*

Atlas Copco Falcon is a high-speed rock drill developed for use in mines and underground workings with a sustained need for overhead drilling—stoping, raises, roof bolting.

Short, compact, well balanced and weighing only 80 pounds, the Falcon is easy to handle yet delivers more speed and power than stopers of heavier weight.

The feed pressure adjustment gives full range of control . . . is set prior to drilling and seldom requires further adjustment while the drill is in operation.

Centralized controls offer simple operation! By opening the throttle a starting sequence is triggered . . . feed, scavenging air, flush water, and impact mechanism are brought into action in that order. This foolproof sequence also eliminates the health hazards due to dry collaring.

Air is constantly blown—even during drilling pauses—through ports surrounding the chuck to prevent fouling of the working parts. To clear the bore hole, air is sent through the flushing pipe into the drill steel.

Falcon (BBD-46-WS is delivered with or without anvil block. Complete information is offered in Leaflet E-909, available on request.

- *For a free demonstration of the Atlas Copco Falcon, call collect today to the nearest of these offices.*

Atlas Copco

ATLAS COPCO PACIFIC, INC., San Carlos, California

ATLAS COPCO EASTERN, INC., Paterson, New Jersey

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PLYMOUTH DIESEL

MINE-O-MOTIVE

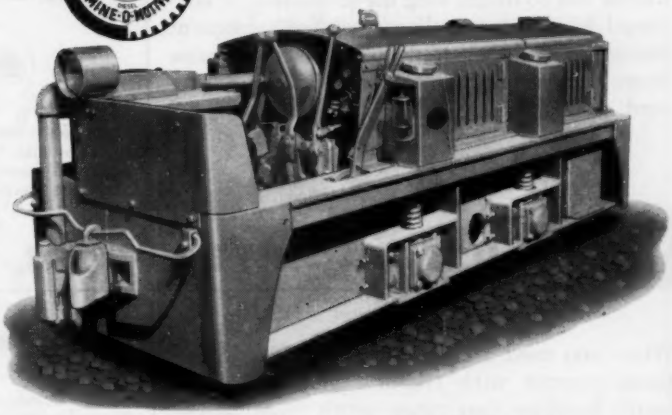
Mine Locomotives 3 to 12 Tons

Engineered expressly for

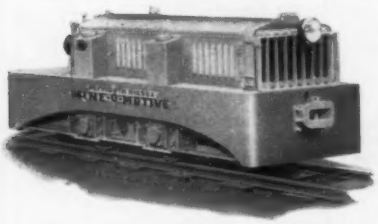
YOUR LOCOMOTIVE HAULAGE

in Today's modern mining operations

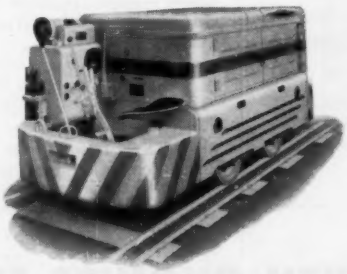
You will find these rugged locomotives performing the toughest hauling jobs in mines and tunnels everywhere. Stamina, stability—ECONOMY in performance, SAFETY in operation—and extra years of trouble-free operation—are ENGINEERED in the design and construction of the Mine-O-Motive series. Controls are convenient, simple, safe. Visibility is excellent. And the Diesel-powered models shown have the famous Torqomotive* Drive for easy starting and smooth operation. They supplement Plymouth gasoline, Diesel and Diesel-electric models which have served all industry since 1914—and with lowest ton-mile costs in the field.



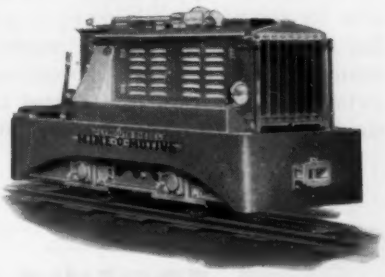
U. S. Bureau of Mines approved exhaust conditioning equipment.



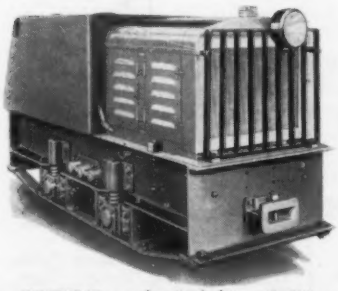
MINE-O-MOTIVE SERIES
Model FMD-00 5 or 6 Tons, Torqomotive* Drive—short wheel base, low center of gravity.



MINE-O-MOTIVE SERIES Model FMD-22 5, 6, 7, 8 or 10 Tons, Torqomotive* Drive (this model approved under Permissible Schedule #22, U. S. Bureau of Mines, for operation in gaseous mines).



MINE-O-MOTIVE SERIES
Model DMD-00, 8 to 12 Tons, with Torqomotive* Drive — low, compact, one-piece welded frame.



SERIES T, mechanical drive, 3, 3½ or 4 Tons. Torqomotive* Drive in 3½ or 4 Tons.

*TORQOMOTIVE DRIVE: Plymouth Transmission coupled to Hydraulic Torque-Converter.

FREE ANALYSIS Send us a brief outline of your hauling operations. An engineering analysis will reach you promptly with latest data on the type and size Mine-O-Motive for the best results in the work you want done.

PLYMOUTH LOCOMOTIVE WORKS

Division of The Fate-Root-Heath Company
Dept. A-26, Plymouth, Ohio

3 ways to cut mining cable costs...

1. USE OKOCORD STANDARD CONSTRUCTIONS

Each Okocord construction has been designed to cut cable replacements on specific mining machines. Standard constructions for most of the important services are built from the conductor out to insure long life in the face of continual high speed reeling, rock-falls, frequent run-overs and constant dragging over mine floors and around corners. Here are four Okocord standard constructions.

Single Conductor—Reel cable made extra flexible and tough, Hex-Tite assembly to withstand re-reeling, rubbing and scraping.

Two-Conductor Round, Type G—Cable with two ground wires and two insulated conductors possesses maximum flexibility.

Three-Conductor Type W—Cable with three insulated conductors is available with heat-resistant insulations for either low or high voltages.

Twin Type G—Cable designed for maximum safety and reel capacity has center grounding wire and two insulated conductors.

2. USE OKONITE SPECIAL CONSTRUCTIONS

When you need a cable with unique specifications, consult with Okonite and avoid the costly troubles that often result from makeshift solutions. Special constructions are available for the newest mining equipment, including all types of continuous miners. Here are examples of the many Okocord special constructions that are manufactured to the same rigid specifications as standard constructions.

Three Conductor-Type PG—Special cable for d-c systems has uninsulated grounding wire which is approximately half the size of the two insulated conductors.

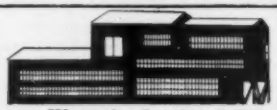
Four-Conductor Type PG—Special cable for d-c systems is similar to three-conductor type except with 3 insulated conductors.

Five-Conductor Type PCG—Special cable for "permissible" equipment features 1 uninsulated grounding, 2 insulated control and 2 insulated power conductors.

Six-Conductor Type PCG—Special cable for a-c systems is similar to five-conductor type except with 3 insulated conductors.

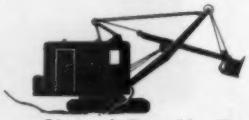
3. CONSULT WITH OKONITE ENGINEERS

The Okonite engineering staff is always ready to help you in the planning stage. Plant or mine power distribution, borehole or shaft cables, control systems, telephone circuits, conveyor controls . . . whatever your needs, Okonite will gladly help you select the safest and most economical cable for the job. Write or phone either our nearest district office or The Okonite Company, Dept. MW, Passaic, N. J.



. . . Watertite-Insulated Wire, Keystone-Insulated Wire, Okocord Flexible Cords, Watertite-Insulated Control Cable, Aerial Cable, Line Wire . . .

. . . Okocord Mine Drill and Control Cord, Okocord Type SO, Parkway, Okonite Mine Power Cable, Okocord Twin Type W . . .



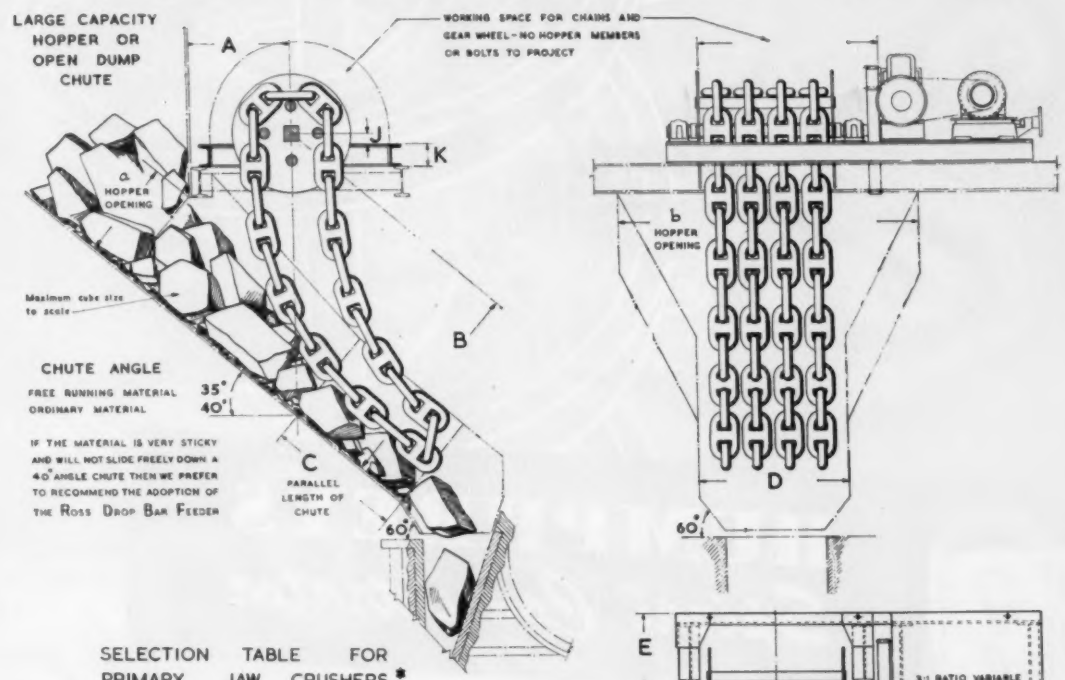
. . . Okocord Portable Cables Types W, G, SH-A, SH-B, SH-C, SH-D . . . Blasting Wire, Redshot Type RG, Type D Braided . . .

. . . Continuous Mining Cable, Okocord Two-, Three-, Four-, Five-, and Six-Conductor Types G, W, PG, and PCG . . . Steel Armored, Self-Supporting . . .

where there's electrical power . . . there's **OKONITE CABLE**

4184-A

NEW DESIGN OF
ROSS PATENT CHAIN FEEDERS



SELECTION TABLE FOR PRIMARY JAW CRUSHERS *

FEEDER SIZE	DIMENSIONS IN INCHES					WEIGHT IN CWTS	SCALE
	MAXIMUM PIECES		CRUSHER MOUTH	HOPPER OPENING			
	CUBE	OCCASIONAL SLAB	Select nearest standard size	a	b		
3 W	9	9 x 13 x 18	18 x 12	18	54	23	1/30
4 W	12	12 x 18 x 24	24 x 16	24	72	48	1/40
5 W	15	15 x 22 x 30	30 x 20	30	90	85	1/50
6 W	18	18 x 27 x 36	36 x 24	36	108	140	1/60
7 W	21	21 x 32 x 42	42 x 28	42	126	220	1/70
8 W	24	24 x 36 x 48	48 x 32	48	144	325	1/80
9 W	27	27 x 40 x 54	54 x 36	54	162	450	1/90
11 V	33	33 x 50 x 66	66 x 44				

* THIS TABLE IS A GUIDE TO JAW CRUSHER INSTALLATIONS. OTHER FEEDING DUTIES TO WHICH THE ROSS CHAIN FEEDER IS APPLICABLE ARE:—
GYRATORY CRUSHERS, HAMMER MILLS, ROPEWAYS
CONE CRUSHERS, CONVEYORS, SKIPS, WAGONS
ROLL CRUSHERS, SCREENS, AND MINE CARS
REFER DETAILS OF DUTY TO OUR ENGINEERING DEPT. FOR RECOMMENDATIONS

FEEDER SIZE	DIMENSIONS IN INCHES										
	A	B	C	D	E	F	G	H	J	K	L
3 W	19	39	24	27	17	19	18	60	2½	4.2	22½
4 W	24	51	32	36	22	26	24	64	3	5.2½	30
5 W	30	63	40	45	28	32	30	80	3½	6.3	37½
6 W	36	75	48	54	33	39	36	96	3¾	7.3	45
7 W	42	87	56	63	39	45	42	112	4¼	8.3	52 2
8 W	48	99	64	72	44	52	48	128	5	9.3½	60
9 W	54	111	72	81	50	58	54	144	5¼	10.3½	67½

OTHER "ROSS" UNITS: **ROSS DROP BAR GRIZZLY FEEDER**
ROSS TWO-ROLL GRIZZLY

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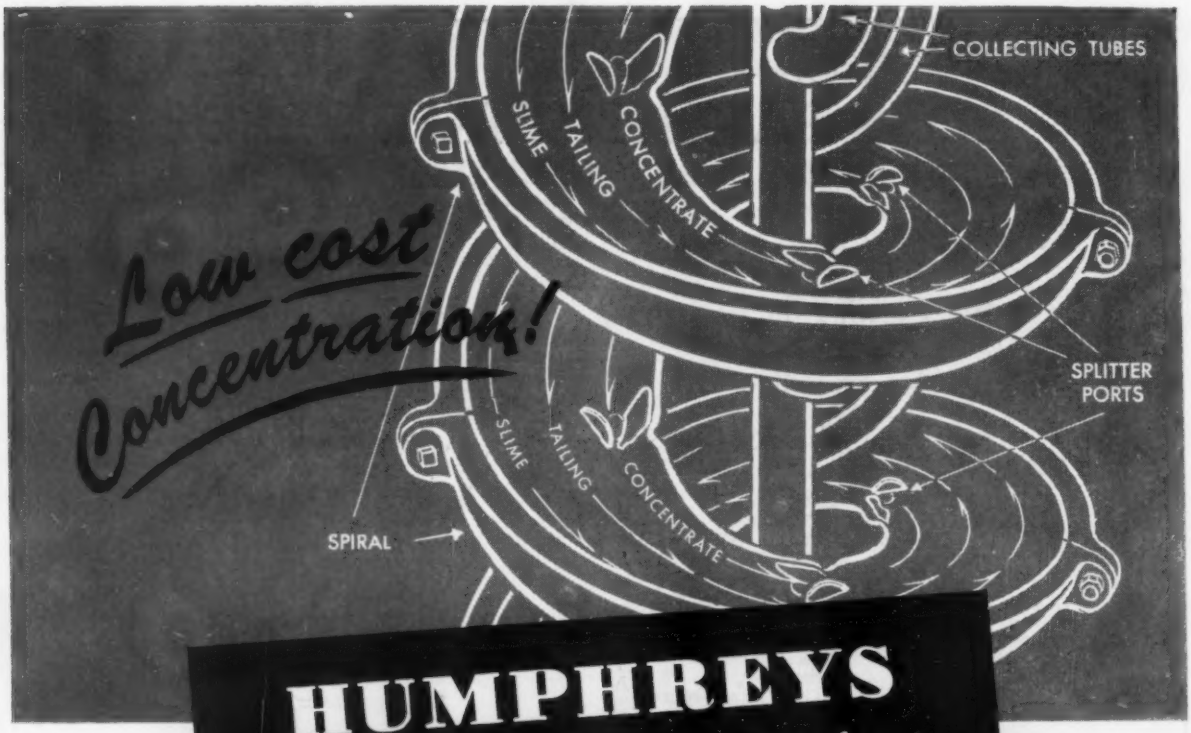
CANADIAN LICENSEE: DORR-OLIVER-LONG, LTD., ORILLIA, ONTARIO



Low cost Concentration!

HUMPHREYS
Spiral Concentrator

LOW COST CONCENTRATION

Humphreys
spiral concentrators
have economically recovered

Hematite	Biotite
Martite	Lepidolite
Magnetite	Vermiculite
Ilmenite	Native Copper
Rutile	Chromite
Zircon	Pyrite
Monazite	Barite
Phosphate	Tantalite
Wolframite	Columbite
Scheelite	Talc
Muscovite	Anthracite Coal

Throughout the world economy-minded mineral producers rely on Humphreys Spirals . . for low-cost concentration and increased production. These highly efficient concentrators are noted for economical installation, low-cost maintenance and dollar-saving operation . . . plus trouble-free performance over long periods of operation. No moving parts. Require very little floor space.

APPLICATIONS:

- Production of a concentrate and a tailing in a single rougher stage.
- Production of a bulk concentrate of several heavy minerals and a finished tailing.
- Scavenging the tailing from another process for the recovery of heavy minerals not amenable to the primary processes.
- Production of a finished concentrate, with a tailing to be treated by another process.

Write today for information on metallurgical tests of your ore samples for spiral treatment.

Engineering Division

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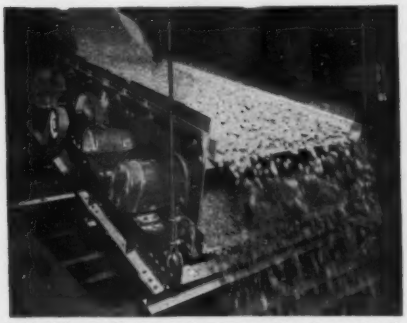
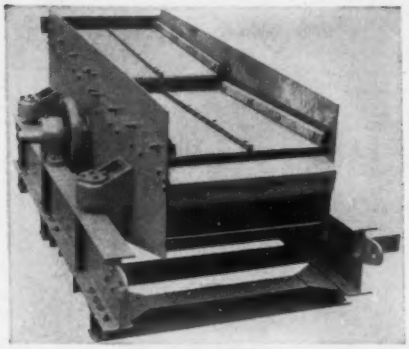


Ty-Rock Screen (Discharge chutes removed to show material)



Tyler-Niagara Screen

Hum-mer Screen

WOVEN WIRE SCREENS

Supplied in all meshes and metals and for all purposes. Tyler Woven Wire Screen is noted for its accuracy and dependability. More than 7,000 specifications are manufactured, many of which are kept in stock ready for immediate shipment.

Write for Catalog 74, Specification Tables of Tyler Woven Wire Screens.

TY-ROCK SCREENS

This full-floating circle-throw screen combines immense capacity with low operating costs — especially for coarse and medium sizing. This is the ideal screen wherever huge tonnages of coal is handled and where flat or low angle screening is desired. Send for Catalogue 65.

TYLER-NIAGARA SCREENS

High-speed circle-throw screens for economical screening of coal products. Send for Catalogue 64.

TY-ELECTRIC HEATED SCREENS

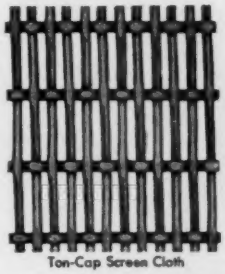
The Ty-Electric System of electric heating of Ty-Rock & Hum-mer Screens represents the most recent development in screening damp materials. The woven-wire screens are heated by passing electric current through the wires. Heat keeps the surface of the wire dry so that fine damp particles will not stick on the wires and blind the openings. Send us details of your damp screening problems so we can make recommendations.

TYLER HUM-MER SCREENS

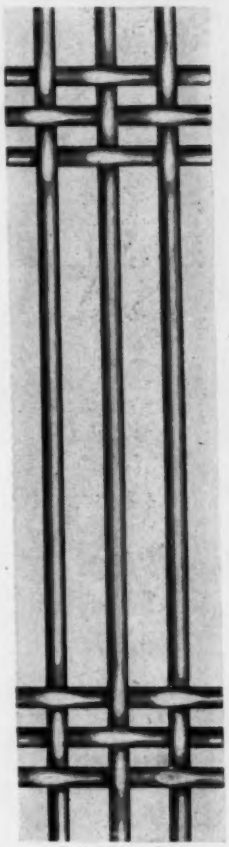
The Hum-mer was the first electrically vibrated screen and is still, by far, the lowest in operating cost for accurate sizing of medium and fine material. The Hum-mer employs less than one H.P. per vibrator and is furnished in one, two or three deck units in both open and closed models. Send for Catalogue 63.

TYLER TESTING SIEVES AND TESTING SIEVE SHAKERS

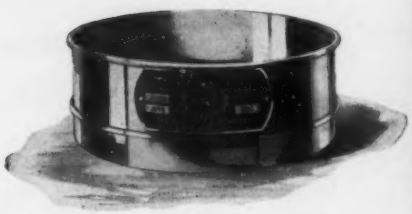
Tyler Standard Screen Scale Testing Sieves are the accepted standard for sieve testing throughout the world. The Ro-Tap Testing Sieve Shaker and the Ty-Lab Tester assure comparable, accurate data. Send for Catalogue 53.



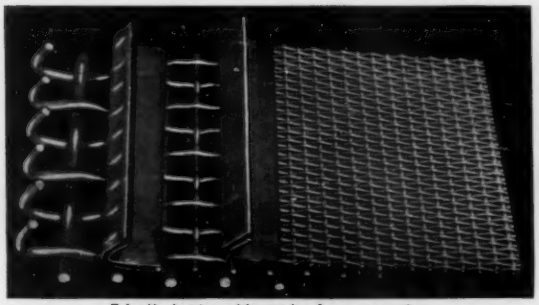
Ton-Cap Screen Cloth



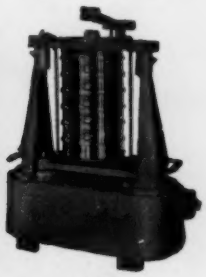
Ty-Rod Screen Cloth



Tyler Standard Screen Scale Testing Sieve



Tyler Hook-strip and bent edge for screen sections



Ro-Tap Testing Sieve Shaker with Tyler Sieves

Complete DENVER MILL EQUIPMENT

One source... one responsibility

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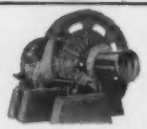
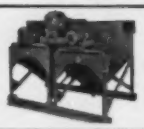
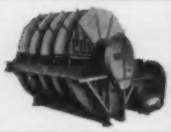
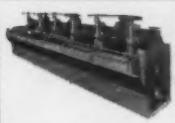
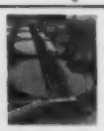
DENVER (Patented) **SUPER AGITATORS & CONDITIONERS**		3′ x 3′ to 20′ x 20′	Patented standpipe around propeller shaft assures positive agitation and circulation. Patented weir collar prevents sand-up on shut-down. Heavy-duty as well as acid-proof construction is available.	Bulletin No. A2-B4
DENVER Steel-Head **BALL MILLS**		3′ x 2′ to 8′ x 20′	A Denver Steel-Head Ball Mill will suit your particular need. Five types of discharge trunnions. All-steel construction. Low initial cost due to quantity production. Quick delivery. Laboratory and pilot plant mills also available.	Bulletin No. B2-B13
DENVER Forced-Feed **JAW CRUSHER**		2¼″ x 3½″ to 36″ x 48″	Cast steel frame, manganese jaw and cheek plates. Large diameter shafts reduce shaft deflection and thus increase life of heavy-duty, oversize roller bearings in bumper. Setting easily controlled.	Bulletin No. C12-B12
DENVER Spiral **CLASSIFIER**		6″ Simplex to 60″ Duplex	Has many improvements. For instance, lower bearing placed above pulp level, arrangement of feed, overflow and direction of rotation result in maximum efficiency. Rake-type and Denver-Finney classifiers also available.	Bulletin No. C5C-B
DENVER Selective **MINERAL JIG**		4″ x 6″ Simplex to 36″ x 48″ Duplex	An improved, pulsating, gravity selector that treats unclassified, unsized feed and recovers minerals as soon as freed. Easy to regulate and control, minimum attention. Use in closed grinding circuit or open circuit.	Bulletin No. J2-B10
DENVER Disc **FILTERS**		2′ dia. x 1 Disc. to 9′ dia. x 8 Disc.	Special, patented design of segments in Denver Disc Filters use both gravity and vacuum to give a drier filter cake. Drainage is complete and positive, with no blow-back. Simple, low-cost, dependable construction. Quick delivery. Also Drum and Pan Filters. Tank Agitator available.	Bulletin No. F9-B2
DENVER "Sub-A" **FLOTATION**		16″ x 16″ to 55″ x 56″	More large plants are installing Denver "Sub-A's" for their entire flotation job — roughing, scavenging, cleaning and re-cleaning — because they give maximum recovery at a low cost per ton. Dependable, low-cost, simplified continuous operation.	Bulletin No. F10-B81
DENVER 6RL **SAND PUMPS**		Up to 2400 G.P.M.	Pressure-molded rubber parts, accurately engineered, give high efficiency at low horsepower. DECO also manufactures Denver Vertical Sand Pumps, and Adjustable Stroke Diaphragm Pumps. Mechanical Seal available.	Bulletin No. P9-B10
DENVER Automatic **SAMPLERS**		16″ to 60″ Cutter Travel	Extra rigid track and ball-bearing wheels assure positive travel and timing of sample cutter. Denver Vezin Type, Denver Snyder Type, or complete sampling systems available. Standard, low cost.	Bulletin No. S1-B4
DENVER Dillon **SCREENS**		1′ x 3′ to 6′ x 14′	Gives fast, clean separation without blinding. Gives even, smooth flow of material because of the patented "true-circle" eccentric action. Two bearing construction saves 50% HP.	Bulletin No. S3-B11
DENVER Spiral Rake **THICKENER**		3′ x 3′ to 125′ x 16′	Enclosed, running-in-oil head motion. Patented spiral rakes move settled solids to center discharge with continuous motion, rapid removal of solids tends to eliminate overload. Wood, Steel or rubber-covered Tanks available.	Bulletin No. T5-B5

OTHER ITEMS: Ore Testing, Mill Design, Pilot Plant and Laboratory Equipment, Jigs, Tables, Hydro Classifiers, Power Plants, Elevators, Conveyors, Reagent and Ore Feeders, Pulp Distributors, Dryers, Ore Cars, Tanks, Placer Equipment, Cyanide and Leaching Equipment.

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DENVER EQUIPMENT COMPANY

1400 SEVENTEENTH STREET DENVER 17, COLORADO PHONE CHerry 4-4466

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LONDON
JOHANNESBURG

HOW TO USE
your
Pre-Filed Catalog Section, The Buyer's Guide For Mine-Mill-Smelter Equipment

USE THIS CARD TO WRITE TO THE MANUFACTURER DIRECT
Postage Required

- Keep the catalog section on your desk for ready reference.
- To find the manufacturer of a specific product: Look under the product heading in Section I of the yellow pages. All principal manufacturers of specialized mine-mill-smelter equipment are listed.
- Next, refer to the manufacturer's catalog or advertisement for further product description. Advertisers are listed in bold face type.
- For complete information on any product, fill-out the attached postage cards.
- The names and addresses of manufacturers are listed alphabetically in Section II of the yellow pages.
- For complete information on the new equipment previewed in the "Blue Ribbon" Section, circle its corresponding number on the Reader Inquiry Card.

These two cards are addressed to Mining World. List the information you want—WE'LL DO THE REST. No postage necessary if mailed in U. S.

- Read the advertisements. They give you the latest information on mining equipment.

GENTLEMEN:

Please send me FREE information on your equipment as advertised and indexed on page ..... in MINING WORLD'S 1957 Annual Catalog Survey and Directory Number.

Product: .....

Product: .....

Name: ..... **Title:** .....

Company: .....

Address: .....

MINING WORLD—WORLD MINING CATALOG SERVICE

MINING-WORLD—WORLD MINING CATALOG SERVICE

MINING WORLD PRODUCT EDITOR:

Please send me FREE information on the equipment advertised and indexed on:

Page: ..... **Product:** ..... **Mfr:** .....

Page: ..... **Product:** ..... **Mfr:** .....

Page: ..... **Product:** ..... **Mfr:** .....

Page: ..... **Product:** ..... **Mfr:** .....

Page: ..... **Product:** ..... **Mfr:** .....

Name: ..... **Title:** .....

Company: .....

Address: .....

MINING WORLD—WORLD MINING CATALOG SERVICE

MINING WORLD "BLUE RIBBON AWARD" EDITOR

I wish to obtain further information on the products of the Blue Ribbon award winners as featured on pages 37, 41, 43, 45, 49, 51.

FILL IN NUMBERS OF ITEMS YOU DESIRE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72

Name: ..... **Title:** .....

Company: .....

Address: .....

THESE CARDS ARE SIMPLE TO USE. THE OTHER SIDE TELLS YOU HOW!

USE THESE CARDS

To get FREE up-to-date information on the newest in mine-mill-smelter equipment

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SAN FRANCISCO 5,
CALIFORNIA
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500 HOWARD STREET
SAN FRANCISCO 5,
CALIFORNIA
U. S. A.

- Section I of the yellow pages is your product index.
- Section II of the yellow pages lists alphabetically all principal manufacturers of specialized mining equipment and their addresses.
- The "Blue Ribbon" Section starting on page 37 will give you the latest equipment developments in the mining industry.
- Keep this catalog section on your desk for ready reference. You will want to refer to it often.

Further information on any product advertised is available. Mail these two cards today. We will forward your request to the manufacturer immediately.

FREE INFORMATION ON THE NEWEST PRODUCT DEVELOPMENTS AVAILABLE FOR 1957

1957 MINING WORLD-WORLD MINING

Catalog Index of Equipment and Manufacturers

The CATALOG INDEX is comprised of two sections:

SECTION I is an alphabetical listing of the specialized products and equipment used by the MINE-MILL-SMELTER industry. All principal manufacturers of these products and equipment are listed for your convenience.

SECTION II is an alphabetical list of all principal manufacturers AND THEIR ADDRESSES.

The names of manufacturers who are represented in this issue by catalogs or advertisements are printed in BOLDFACE type in Sections I and II. The page numbers of their catalogs or advertisements are also given in Section II.

Every effort has been made to make your MINING WORLD-WORLD MINING CATALOG ISSUE, Development and Directory Number as complete and accurate as possible. MINING WORLD, however, cannot be responsible for changes in names, addresses, and other discrepancies.

SECTION I

Equipment Index

SECTION I contains an alphabetical list of product and equipment names. Wherever feasible, equipment has been indexed under headings representing the nomenclature preferred by the industry; or in many cases under the principal proper noun. For example, "Flotation Machines" are indexed as such rather than under the all-encompassing heading "Machines." Rock Drills, however, have been most logically listed as "Drills, Rock."

ACETYLENE

See Welding Equipment, Supplies, and Services

ACID

See Reagents and Chemicals

ACTUATORS

See Cylinders and Actuators

AERIAL SURVEYING

See Exploration Services

AGGLOMERATING EQUIPT. AND SUPPLIES

See Pelletizing and Nodulizing Equipt.

AGITATORS AND CONDITIONERS

Black, Sivalls & Bryson, Inc.
BOOTH CO., INC., THE
Carrier Corp.
DAVIS—SEE GALIGHER CO.
DENVER EQUIPMENT CO.
DENVER SUPER—SEE DENVER EQUIPMENT CO.
DORR-OLIVER INC.
Dravo Corp.
EIMCO CORP.
GALIGHER CO.
General American Transportation Corp.
General Electric Co., Ltd., The
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-Deutz, A. G.
International Engineering, Inc.
KENNEDY-VAN SAUN MFG. & ENG., CORP.
Klockner-Humboldt-Deutz A.G.
Minera Foundry & Mfg. Co.
Minerais et Metaux
MORSE BROS. MACHINERY CO.
NATIONAL TANK & PINE CO.
Philadelphia Gear Works, Inc.
SANTA FE TANK DIV., FLUOR PRODUCTS CO.
SMIDTH & CO., F. L.
Standard Elec. Mfg. Co., Inc.
TELLURIDE IRON WORKS CO.
WEMCO—SEE WESTERN MACHINERY CO.
Western Gear Works, Pacific Gear Plant
WESTERN MACHINERY CO.
Westinghouse Air Brake Co., Le Roi Div.

AIRCRAFT

SEE EXPLORATION SERVICES

AIR DRIVEN TOOLS

See Tools, Air Driven

AIR LEG

Atlas Copco, A.B. Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
CHICAGO PNEUMATIC TOOL CO.
Cleveland Div., Westinghouse Air Brake Co.
Consolidated Pneumatic Tool Co., Ltd.
Drullard Co., Howard
GARDNER-DENVER CO.
Holan Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
TELLURIDE IRON WKS.
Thor Power Tool Co.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co. (Pa.)
Westinghouse Air Brake Co., Le Roi Div.

AMALGAMATORS

CLARK-TODD—SEE MINE & SMELTER SUPPLY CO., THE
DENVER EQUIPMENT CO.
Gibson, W.W.
Klockner-Humboldt-Deutz A.G.
Mill & Mine Supply, Inc.
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
Scott's Concentrators
Snyders Mine & Chem. Lab.
TELLURIDE IRON WORKS, CO.
Titan—see Mill & Mine supply, Inc.

ARMS AND POSTS

PNEUMATIC

CHICAGO PNEUMATIC TOOL CO.
Drullard Co., Howard
GARDNER-DENVER CO.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.

MECHANICAL

Cleveland Div., Westinghouse Air Brake Co.
Drullard Co., Howard
GARDNER-DENVER CO.
INGERSOLL-RAND CO.
Thor Power Tool Co.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co. (Pa.)

ASSAY SUPPLIES

See Laboratory Equipment and Supplies

ASSAYERS

See Laboratories & Assayers

AUGERS

See Drills; Bits

BAGS

FILTER BAGS

American Air Filter Co., Inc.
Bemis Bro. Bag Co.
EIMCO CORP., THE
Filter Fabrics, Inc.
Menardi & Co.
National Filter Media Corp.
NORTHERN BLOWER CORP.

Pendleton Woolen Mills
Westinghouse Air Brake Co., Le Roi Div.

ORE AND CONCENTRATE BAGS

Arizona Bag Co.
Bemis Bro. Bag Co.
Filter Fabrics, Inc.

SAMPLE BAGS

Arizona Bag Co.
Bemis Bro. Bag Co.
DFC—see Denver Fire Clay Co., The
Denver Fire Clay Co., The
Drullard Co., Howard
Filter Fabrics, Inc.
Hammond Bag & Paper Co.
Tamping Bag Co., The
Union Bag & Paper Co.

BALL MILLS

See Grinding Equipment

BALLS

See Grinding Equipment

BATTERIES

See also Safety Equipment

AUTOMOTIVE AND LIGHT PLANT

C&D Batteries, Inc.
ELECTRIC STORAGE BATTERY CO., THE EXIDE INDUSTRIAL DIV.
Gates Rubber Co.
GENERAL MOTORS OVERSEAS OPERATIONS
General Petroleum Corp.
Gould-National Batteries, Inc.
GRAYBAR ELECTRIC CO., INC.
Gulf Oil Corp.-Gulf Refining Co.

LOCOMOTIVE

C & D Batteries, Inc.
C & D Slyver-Clad—See C & D Batteries, Inc.
Edison Inc. Thomas A.
ELECTRIC STORAGE BATTERY CO., THE, EXIDE INDUSTRIAL DIV.
EXIDE-IRONCLAD—SEE ELECTRIC STORAGE BATTERY CO., THE EXIDE INDUSTRIAL DIV.
Gould-National Batteries, Inc.

BATTERY CHARGERS

See Chargers, Battery

BEARINGS

BALL

Dodge Mfg. Co.
FRICTION FIGHTER—SEE LINK BELT CO.
General Motors Corp., New Departure Div.
LINK-BELT CO.
M R C—see Marlin-Rockwell, Inc.
Nice Ball Bearing Co.
SC & SCM—see Dodge Mfg. Co.
S K F Industries, Inc.
STEPHENS-ADAMSON MFG. CO.

ROLLER

Chain Belt Co.
Dodge Mfg. Co.
Dodge-Timken—see Dodge Mfg. Co.
FRICTION FIGHTER—SEE LINK BELT CO.
LINK-BELT CO.
Marlin-Rockwell, Inc.
Roller Bearing Co. of Amer.
Rollway Bearing Co., Inc.
S K F Industries, Inc.
Shafer—see Chain Belt Co.
TIMKEN ROLLER BEARING CO.
Tyson Bearing Corp.

SLEEVE

Ampco Metal, Inc.
Ampco Metal Bronze—see Ampco Metal, Inc.
Dodge Mfg. Co.
LINK-BELT CO.
Sleevoil—see Dodge Mfg. Co.
STEARNS-ROGER MFG. CO

BELL SYSTEMS

See Communications

BELTS AND BELTING

See also Conveyor Equipment; Fasteners, Belts, Safety Equipment

CHAIN, LINK AND METAL

AMERICAN BRAKE SHOE CO.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
American Chain & Cable Co., Inc. American Chain Div.
Bodinson Mfg. Co.
COLORADO FUEL & IRON CORP., THE
Conveyor Co., The
Korb-Pettit Wire Fabrics & Iron Works, Inc.
LINK-BELT CO.
TAYLOR-WHARTON IRON & STEEL CO.
TELLURIDE IRON WKS.
U. S. STEEL EXPORT CO.
Yuba Manufacturing Co.
WISCO—SEE COLORADO FUEL & IRON CORP.

LEATHER BELTING

Dodge Mfg. Corp.
Gates Rubber Co.
Goodall Rubber Co.
Houghton & Co., E. F.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Rhoads & Son, J. E.
Tannate—see Rhoads & Son, J. E.
Vim-Tred—see Houghton & Co., E. F.
Williams & Sons, I. B.

RUBBER BELTING

Flat Belts

AJAX—SEE HEWITT-ROBINS, INC.
American Rubber Mfg. Co.
Barber-Greene Company
Bear—see American Rubber Mfg. Co.
Boston Woven Hose & Rubber Co.
Carlyle Rubber Co., Inc.
Challenger—see Lee Rubber & Tire Corp., Republic Rubber Div.
CONSERVO—SEE HEWITT-ROBINS, INC.
Crackerjack—see American Rubber Mfg. Co.
Gates Rubber Co.
Goodall Rubber Co.
Goodrich Co. B. F., The Industrial Prod. Div.
Goodyear Tire & Rubber Co.
HEWITT-ROBINS, INC.
Invader—see Lee Rubber & Tire Corp., Republic Rubber Div.
Korb Pettit-Wire Fabrics & Iron Wks., Inc.
Lee Rubber & Tire Corp., Republic Rubber Div.
MALTESE CROSS—SEE HEWITT-ROBINS, INC.
Quaker Pioneer Rubber Mills
Quaker Rubber Co.
Raybestos-Manhattan, Inc.
Republic Rubber Div., Lee Rubber & Tire Corp.
Rhoads & Sons, J. E.
Thermoid Co.
United States Rubber Co.
United States Rubber Int'l.
Williams & Sons, I. B.
Yosemite—see American Rubber Mfg. Co.

RUBBER BELTING

V-Belts

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Boston Woven Hose & Rubber Co.
Carlyle Rubber Co., Inc.
Champion—see Lee Rubber & Tire Corp., Republic Rubber Div.
Conveyor Co., The
Dayton Rubber Co.
Dodge Manufacturing Corp.
Gates Rubber Co.
Goodall Rubber Co.
Goodrich Co., B. F. The, Industrial Products Div.
Goodyear Tire & Rubber Co.
HEWITT-ROBINS, INC.
Lee Rubber & Tire Corp., Republic Rubber Div.
LINK-BELT CO.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Quaker Pioneer Rubber Mills
Quaker Rubber Co.
Raybestos-Manhattan, Inc.
Republic Rubber Div., Lee Rubber & Tire Corp.
Rhoads & Sons, J. E.
Sealed-Life—see Dodge Mfg. Co.
TEXROPE—SEE ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Thermoid Co.
United States Rubber Co.
United States Rubber Int'l.
Williams & Sons, I. B.
Worthington Corp.

BINS, CHUTES & ACCESSORIES

See also Feeders

BINS AND CHUTES

ALLISON STEEL MFG. CO.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Barber-Greene Co.
Bethlehem Steel Co.
Bodinson Mfg. Co.
COLUMBIAN STEEL TANK CO.
Com-Bin Feeder—see Pulva Corp.
Conveyor Co., The
Diamond Iron Works Div., Goodman Mfg. Co.
General American Transportation Corp.
General Electric Co., Ltd., The
Hack Engineering Co.
HEWITT-ROBINS INC.
Hirsch Bros. Machinery Co.
Hockensmith Corp., The
Humboldt, Kloekner-Humboldt-Deuts, A. G.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
KENNEDY-VAN SAUN MFG & ENG. CORP.
Kloekner-Humboldt-Deuts A. G.
Koehring Co., Johnson Co., C. S. a Subsid
LINK-BELT CO.
Lippmann Engineering Works
MAYO TUNNEL & MINE EQUIP.
McNally Pittsburgh Mfg. Co.
Miners Foundry & Mfg. Co.
NATIONAL IRON CO.
Ogden Iron Works Co.
Pioneer Engineering Div., Poor & Co,. Inc.
Pioneer Engineering Works, Inc.
Pollock Co., The Wm. B.
Richardson Scale Co.
Roberts & Schaefer Co.
Rogers Iron Works
Sanford-Day Iron Works, Inc.
Saracco Tank & Welding Co.
Smith Engineering Works
STEARNS-ROGER MFG. CO.
STEPHENS-ADAMSON MFG. CO.
Straub Mfg. Co.
Sturtevant Mill Co.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
United States Steel Co., Amer. Bridge Div.
Universal Engineering Corp.
Wamsco—see Washington Machinery Co.
Washington Machinery Co.
Watt Car & Wheel Co., The
Yuba Mfg. Co.

GATES, LIPS, ETC.

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
Conveyor Co., The
HEWITT-ROBINS, INC.
Hirsch Bros. Machinery Co.
Humboldt, Kloekner-Humboldt-Deutz, A. G.
Kloekner-Humboldt-Deutz, A. G.
Koehring Co., Johnson Co., C. S. a subsid.
LINK-BELT CO.
Lippmann Engineering Works
McNally Pittsburgh Mfg. Co.
Miners Foundry & Mfg. Co.
Ogden Iron Works Co.
Pioneer Engineering Div., Poor & Co., Inc.
Roberts & Schaefer Co.
Sanford-Day Iron Works, Inc.
Saracco Tank & Welding Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
Wamco—see Washington Machinery Co.
Washington Machinery Co.

INDICATORS

Bin-Dicator Co., The
Convair, Inc.
Conveyor Co., The
DENVER EQUIPMENT CO.
HEWITT-ROBINS, INC
Hirsch Bros. Machy. Co.
Koehring Co., Johnson Co., C. S. a subsid.
McNally Pittsburgh Mfg. Co.
ROBIN TRONIC—SEE HEWITT-ROBINS, INC.
Saracco Tank & Welding Co.
STEPHENS-ADAMSON MFG. CO.
TELLEVEL—SEE STEPHENS-ADAMSON MFG. CO.
TELLURIDE IRON WKS.

VIBRATORS

Barber-Greene Co.
Bodinson Mfg. Co.
Carrier Conveyor Corp.
Cleveland Vibrator Co., The
DENVER EQUIPMENT CO.
General Electric Co. Ltd., The
KENNEDY-VAN SAUN MFG. CO.
Lippman Engineering Works
Rotary Silent—see Martin Engineering Co.
Saracco—see Saracco Tank & Welding Co.
Saracco Tank & Welding Co.
STEPHENS-ADAMSON MFG. CO.
SYNTRON CO.
TY-SPEED—SEE TYLER CO., THE W. S.
TYLER CO., THE W. S.
Universal Engineering Corp.

BITS

See also Steel

AUGER BITS

Bowdill Co. The
Cardox Corp.
Central Mine Equipment Co.
Coeur d'Alene Hardware & Foundry Co.
Failing Co., Geo. C.
Firth Sterling Inc.
Firthite—see Firth Sterling Inc.
GARDNER-DENVER CO.
General Electric Co., Carboloy Dept.
KENNAMETAL INC.
Kerfmaster—see Central Mine Equipment Co.
MOBILE DRILLING INC.
Pennsylvania Drilling Co.
Salem Tool Co.
Vascoloy-Ramet Corp.

CHURN BITS

BUCYRUS-ERIE CO.
General Electric Co., Carboloy Dept.
Mill Iron Works, Inc.
MOBILE DRILLING, INC.
SPANG & CO.
Westinghouse Air Brake Co., Le Roi Div.

DIAMOND BITS

ACKER DRILL CO., INC.
American Coldset Corp.
ASCOLITE—SEE SMIT & CO., ANTON
BOYLES BROS. DRILLING CO.
BOYLES BROS. DRILLING CO., LTD., (CANADA)
BRONZOLITE—SEE SMIT & CO., INC., ANTON
Champion Diamond Co.
CHRISTENSEN DIAMOND PRODUCTS CO.
Dameo—see Drilling Accessory & Mfg. Co., Inc.
DIAMOND TOOL RESEARCH CO., INC.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Drilling Accessory & Mfg. Co., Inc.
Failing Co., Geo. C.
General Electric Co., Carboloy Dept.
Hard Hed—see Smit & Sons, Inc., J. K.
Havlick, J. L.
Hoffman Bros. Drilling Co.
IMPREGNALITE—SEE SMIT & CO., INC., ANTON
JOY MANUFACTURING CO.
Koebel Diamond Tool Co.
Koebelite—see Koebel Diamond Tool Co.
LONGYEAR CO., E. J.
McClintock Co., R. S.
Metal Carbides Corp.
MOBILE DRILLING INC.
Mott Core Drilling Co.
NICOLITE—SEE SMIT & CO., INC., ANTON
Pennsylvania Drilling Co.
PERMASET—SEE BOYLES BROS. DRILLING CO., LTD.
Porto Tool Co.
ROSSET—SEE SPRAGUE & HENWOOD, INC.
Shark Tooth—see American Coldset Corp.
SMIT & CO., INC., ANTON
Smit & Sons, Inc., J. K.
SPRAGUE & HENWOOD, INC.
TELLURIDE IRON WORKS CO.
THOR POWER TOOL CO.
TUFSET—SEE SPRAGUE & HENWOOD, INC.
TRUCAST—SEE SPRAGUE & HENWOOD, INC.
Truco—see Wheel Trueing Tool Co.
VAREL DIAMOND PRODUCTS CO.
VAREL MANUFACTURING CO.
Wheel Trueing Tool Co.

PERCUSSION BITS

Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
Atlas Copco, A. B., Sweden
BRUNNER & LAY, INC.
BUCYRUS-ERIE CO.
CARSET—SEE INGERSOLL-RAND CO.
Cleveland Rock Drill Div., Westinghouse Air Brake Co.
Firth Sterling, Inc.
GARDNER-DENVER CO.
General Electric Co., Carboloy Dept.
Hillman Co., Inc., C. Kirk
Holman Bros. Ltd., (England)
Holman Brothers (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.
KENNAMETAL INC.
LIDDICOAT—SEE WESTERN ROCK BIT MFG. CO.
Manchester Bit. Corp.
McCauley Industrial Corp.
Metal Carbides Corp.
Minerals Engineering Co., (Colo.)
MOBILE DRILLING INC.
Powermite Drill & Tool Co.
ROK BITS—SEE BRUNNER & LAY INC.
SANDVIK COROMANT—SEE ATLAS COPCO PACIFIC, INC.
Thor Power Tool Co.
Throwaway Bit Corp.
TIMKEN—SEE TIMKEN ROLLER BEARING CO.
TIMKEN ROLLER BEARING CO.
Tungstone—see Minerals Eng. Co.
Vascoloy—Ramet Corp.
WESTERN ROCK BIT MANUFACTURING CO.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.

ROTARY BITS

BLUE DEMON—SEE HAWTHORNE, INC., HERB J.
Central Mine Equipment Co.
CHICAGO PNEUMATIC TOOL CO.
Coalmaster—see Central Mine Equipment Co.
Dameo—see Drilling Accessory & Mfg. Co., Inc.
Demo Tool Co.
Drilling Accessory & Mfg. Co., Inc.
Failing Co., Geo.
Firth Sterling Inc.
Firthite—see Firth Sterling, Inc.
General Electric Co., Carboloy Dept.
HAWTHORNE, INC., HERB J.
HITCHCOCK MFG. CO., LEO
Hoffman Bros. Drilling Co.
HUGHES TOOL CO.
KENNAMETAL INC.
Kerfmaster—see Central Mine Equipment Co.
LONGYEAR CO., E. J.
Mobile Drilling, Inc.
Porto Tool Co.
Powermite Drill & Tool Co.
STANCO MFG. & SALES, INC.
VAREL MFG. CO.
Vascoloy-Ramet Corp.
Westinghouse Air Brake Co., Le Roi Div.
WINTER WEISS CO., THE

BLASTING SUPPLIES

BLASTING MACHINES

ATLAS POWDER CO.
Coeur d'Alene Hardware & Foundry Co.
DU PONT DE NEMOURS & CO., E. I., EXPLOSIVES DIV.
Hercules Powder Co.
Olin Mathieson Chem. Corp., Explosives Div.
SHOT MASTER—SEE ATLAS POWDER CO.
Sly Mfg. Co., W. W., The
Trojan Powder Co.

DETONATING FUSES

ATLAS POWDER CO.
Canadian Safety Fuse Co., Ltd.
Coeur d'Alene Hardware & Foundry Co.
DU PONT DE NEMOURS & CO., E. I., EXPLOSIVES DIV.
Ensign Bickford Co., The
Hercules Powder Co.
Olin Mathieson Chem. Corp., Explosives Div.
Primacord—see Canadian Safety Fuse Co., Ltd.
Trojan Powder Co.

ELECTRIC CAPS

AMERICAN CYANAMID CO., EXPLOSIVE DEPT.
ATLAS POWDER CO.
Coeur d'Alene Hardware & Foundry Co.
DU PONT DE NEMOURS & CO., INC., E. I., EXPLOSIVES DIV.
Hercules Powder Co.
Olin Mathieson Chem Corp., Explosives Div.
ROCKMASTER—SEE ATLAS POWDER CO.
Trojan Powder Co.

EXPLOSIVES

AMERICAN CYANAMID CO.
Apache Powder Co.
ATLAS-GIANT—SEE ATLAS POWDER CO.
ATLAS POWDER CO.
Coeur d'Alene Hardware & Foundry Co.
DU PONT DE NEMOURS & CO., INC., E. I., EXPLOSIVES DIV.
Hercules Powder Co.
Illinois Powder Mfg. Co.
International Geophysics, Inc.
King Powder Co., The
Multipulse—see International Geophysics, Inc.
Olin Mathieson Chem Corp., Explosives Div.
Trojan Powder Co.

SAFETY FUSES

ATLAS POWDER CO.
Black Clovir—see Canadian Safety Fuse Co., Ltd.
Canadian Safety Fuse Co., Ltd.
Coeur d'Alene Hardware & Foundry Co.
COAST MFG. & SUPPLY CO.
DU PONT DE NEMOURS & CO., E. I. EXPLOSIVES DIV.
Ensign Bickford Co., The
Hercules Powder Co.
National Fuse & Powder Co.
Olin Mathieson Chem. Corp., Explosives Div.
Trojan Powder Co.

ACCESSORIES—other than above

AMERICAN CYANAMID CO., EXPLOSIVE DEPT.
ATLAS POWDER CO.
Canadian Safety Fuse Co., Ltd.
COAST MFG. & SUPPLY CO.
Coeur d'Alene Hardware & Foundry Co.
DU PONT DE NEMOURS & CO., INC., E. I., EXPLOSIVES DIV.
Economy Fuse & Mfg. Co.
Ensign-Bickford Co.
Hercules Powder Co.
Johnson Loading Supplies, G. R.
Lock-Hook—see Johnson Loading Supplies, G. R.
MAHOGANY IMPORTING CO.
MINE SAFETY APPLIANCES CO.
Minnesota Mining & Mfg. Co. Irvington Varnish & Insulator
National Fuse & Powder Co
Olin Mathieson Chem. Corp., Explosive Dept.
Plastic Tamping Stick Sales
Primacord—see Ensign-Bickford Co.
Tamping Bag Co., The
Thermalite—see Canadian Safety Fuse Co., Ltd.
Trojan Powder Co.

BLOCKS & SHEAVES

See also Conveyor Equipment

ALL CASTEEL—SEE VULCAN IRON WORKS (Pa.)
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP, EXPORT DIV.
ALLOY STEEL & METALS CO.
AMERICAN BRAKE SHOE CO.
American Hoist & Derrick Co., Crosby-Laughlin Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
CARD IRON WORKS CO., THE C. S.
Crosby Load Rated—see Amer. Hoist & Derrick
Dodge Manufacturing Corp.
DUROLITE — SEE SAUERMAN BROS., INC.
GRIPHOIST, INC.
HEWITT-ROBINS, INC.
Hockensmith Corp., The
Jones Foundry & Machine Co., W. A.
JOY MANUFACTURING CO.
Keeney Co., Paul E.
LAKE SHORE INC.
NATL. MALLEABLE & STEEL CASTINGS CO.
Natl Supply Co., The
Ogden Iron Works Co.
Ohio Hoist & Mfg. Co.
PACIFIC—SEE ALLOY STEEL & METALS CO.
Page Engr. Co.
RIBLET TRAMWAY CO.
Rope master—see Keeney Co., Paul E.
Sanford-Day Iron Works, Inc.
SAUERMAN BROS., INC.
SKOOKUM CO.
Taper-Lock—see Dodge Mfg. Co.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Tool Steel Gear & Pinion Co., The
VULCAN IRON WKS. CO., (COLO.)
VULCAN IRON WORKS. CO. (PA.)
Washington Iron Wks.
Yuba Manufacturing Co.

BLOWERS

See Ventilation Equipment and Blowers

BODIES

See Trucks and Trailers; Mine Cars

BOLTS, ROCK

BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
CF&I—SEE COLORADO FUEL & IRON CORP., THE
COLORADO FUEL & IRON CORP.
Commercial Shearing & Stamping Co., The
Elreco Corp., The
Ohio Brass Co.
Oliver Iron & Steel Corp.
Republic Steel Corp.
SHEFFIELD STEEL DIV., ARMCO STEEL CORP.
TELLURIDE IRON WKS.
U. S. Industries Inc.
U. S. Steel Corp.—Tennessee Coal & Iron Div.
Youngstown Sheet & Tube Co., The

BOOM ASSEMBLIES

See Drills; Excavators and Attachments

BRAKES

DRUMS AND MECHANISMS LINING

See Friction Material

BRUSHES, ELECTRICAL

See Electrical Equipment

BUCKETS

See also Hoisting Equipment: Tramways, Aerial; Dredges and Dredge Buckets; Conveyor Equipment

DRAGLINE BUCKETS

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BUCYRUS-ERIE CO.
CRESCENT—SEE SAUERMAN BROS., INC.
ELECTRIC STEEL FOUNDRY
ESCO—SEE ELECTRIC STEEL FOUNDRY
Page Engr. Co.
Pettibone Mulliken Corp.
RED ARCH—SEE BUCYRUS-ERIE CO.
SAUERMAN BROS. INC.
Taylor-Wharton Iron & Steel Co.

GRAB BUCKETS

Blaw-Knox Co., Blaw-Knox Div.
Haiss Mfg. Co., Geo.
HARNISCHFEGER CORP.
Koehring Co.
Link Belt Speeder Corp.
Owen Bucket Co.

POWER SHOVEL DIPPERS

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BUCYRUS-ERIE CO.
ELECTRIC STEEL FOUNDRY
ESCO—SEE ELECTRIC STEEL FOUNDRY
Pettibone Mulliken Corp.
Taylor-Wharton Iron & Steel Co.

BUILDINGS, METAL

ALLISON STEEL MFG. CO.
Aluminum Co. of America
Armco Drainage & Metal Products, Inc.
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Blaw-Knox Co., Blaw-Knox Div.
COLUMBIAN STEEL TANK CO.
Republic Steel Corp., Truscon Steel Div.
Soulé Steel Co.
Truscon—see Republic Steel Corp.
U. S. Steel Corp., American Bridge Div.
UNITED STATES STEEL EXPORT CO.

BULLDOZERS

See Tractors and Attachments

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

BURNERS, OIL & GAS

BABCOCK & WILCOX CO., THE
DFC—see Denver Fire Clay Co., The
Denver Fire Clay Co., The
GENERAL MOTORS OVERSEAS OPERATIONS
Iron Fireman Mfg. Co.
KENNEDY-VANSAUN MFG. & ENG. CORP.
MINE & SMELTER SUPPLY CO.
National Airoil Burner Co.

BUYERS OF ORES AND CONCENTRATES

See "Possible Markets Ores, Metals and Non-metallics" elsewhere in this edition

CABLE AND CONDUIT

See also Rope, Wire; Tramway, Aerial

ELECTRICAL CABLE AND CONDUIT

Alphaduct Wire & Cable Co.
Aluminum Co. of America
ANACONDA WIRE AND CABLE CO.
Ankoseal—The Ansonia Wire & Cable Company
Ansonia Wire & Cable Company, The
BETHLEHEM PACIFIC COAST STEEL CORP.
Buckeye—see Youngstown Sheet & Tube Co.
C M G Industries
Canada Wire & Cable Co., Ltd.
Carlon Prod. Corp.
Chase Brass & Copper Co.
Circle Wire & Cable Corp.
Collyer Insulated Wire Co.
Electriduct—see CMG Industries
Essex Wire Corp.
Flex-A-Power—see General Electric Co.
GENERAL CABLE CO.
General Electric Co.
General Electric Co., Construction Materials Dept.
GRAYBAR ELECTRIC CO., INC.
HAZACORD—SEE OKONITE CO.
Hazard Insulated Wire Wks.
International General Electric Co.
JOHNSM-ANVILLE SALES CORP.
KORDUCT—SEE JOHNS-MANVILLE SALES CORP.
Lowell Insulated Wire Corp.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIVISION
Minnesota Mining & Mfg. Co., Irvington Varnish & Insulator, Division
Mosebach Electric & Supply Co.
National Supply Co., The
OKONITE COMPANY, HAZARD INSULATED WIRE WORKS
Paranite—see Essex Wire Corp., Paranite Wire and Cable Div.
Phelps Dodge Copper Products Corp.
Roebling's Sons Corp., John A.
ROME CABLE CORP.
ROME 60—SEE ROME CABLE CORP.
SIMPLEX WIRE & CABLE CO.
Spang—see National Supply Co., The
TIGER BRAND—SEE U. S. STEEL EXPORT CO.
TRANSITE — SEE JOHNS-MANVILLE SALES CORP.
United States Rubber Co.
U. S. STEEL CORP., AMERICAN STEEL & WIRE DIV.
UNITED STATES STEEL CORP., COLUMBIA GENEVA STEEL DIV.
UNITED STATES STEEL EXPORT CO.
Western Insulated Wire Co.
Youngstown Sheet & Tube Co., The

CABLEWAYS, EXCAVATING

See Excavators

CAGES

See Hoisting Equipment

CALCINERS

See Dryers and Kilns; Pyrometallurgical Equipment

CAPS

See Blasting Supplies

CARBIDE

CALCIUM—See also Tungsten Carbide Products

Air Reduction Sales Co.
INDUSTRIAL AIR PRODUCTS CO.
Monsanto Chemical Co.
National Carbide Co.
National Cylinder Gas Co.
Shawinigan Prod. Corp.
Union Carbide & Carbon Corp.—Linde Air Products Co.

CARS, MINE

See also Haulage Units, Off-rail

A C F Industries, Inc. American Car & Foundry Div.
ALLISON STEEL MFG. CO.
Atlas Car & Mfg. Co., The
BALDWIN - LIMA - HAMILTON CORP.
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
CARD IRON WORKS CO., THE, C. S.
Coeur d'Alene Hardware & Foundry Co.
DIFFERENTIAL STEEL CAR CO.
GETMAN BROS. MFG. DIV., INC.
Gregg Co., Ltd., The
Hirsch Bros. Machinery Co.
Hockensmith Corp. The
Irwin Foundry & Mine Car Co.
LAKE SHORE INC.
Landis Steel Co.
LOHED—SEE LAKE SHORE, INC.
Magor Car Corp.
MAYO TUNNEL & MINE EQUIP.
Miners Foundry & Mfg. Co.
NC-1—SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.
NATIONAL IRON CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
Ogden Iron Works Co.
Pacific Car & Foundry Co.
Sanford-Day Iron Works Co.
SCOOT-CRETE ORE CARRIER—SEE GETMAN BROS. MFG. DIV., INC.
TELLURIDE IRON WORKS
Union Iron Works
U. S. Industries, Inc.
U. S. Industries Inc. Iron Works
UNITED STATES STEEL CORP.—AMERICAN BRIDGE DIV.
U. S. STEEL CORP., COLUMBIA GENEVA STEEL DIV.
UNITED STATES STEEL CORPORATION
U. S. S.—SEE UNITED STATES STEEL CORPORATION
UNITED STATES STEEL EXPORT CO.
Watt Car & Wheel Co., The
Westinghouse Air Brake Co., Le Roi Div.

AXELS, WHEELS AND TRUCKS

See above

CAR PASSERS

AMERICAN MINE DOOR COMPANY
CANTON—SEE AMERICAN MINE DOOR COMPANY
CARD IRON WKS.
MAYO TUNNEL & MINE EQUIP.
Miners Foundry & Mfg. Co
TELLURIDE IRON WORKS CO.

CAR SHAKERS

See Shakers, Car

CELLS, FLOTATION

See Flotation Machines

CHAIN AND ACCESSORIES

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
American Chain & Cable Co., Inc., American Chain Div.
Amer. Hoist & Derrick Co., Crosby-Laughlin Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bowdill Co., The
Chain Belt Co.,
ELECTRIC STEEL FOUNDRY CO.
JEFFREY MANUFACTURING CO.
Laughlin—see Amer. Hoist & Derrick Co.
Laughlin Co., The, Thomas
LINK-BELT CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
Page Engr. Co.
Republic Steel Corp.
Rex—see Chain Belt Co.
Ryerson & Son, Inc., Joseph T.
Taylor-Wharton Iron & Steel Co.
Tisco—see Taylor-Wharton Iron & Steel Co.
Thomas Laughlin Div., American Hoist & Derrick Co.
Wilmot Engineering Co.

CHAIN HOISTS

American Chain & Cable Co., Wright Hoist Div.
CHICAGO PNEUMATIC TOOL CO.
Coffing Hoist Div., Duff-Norton Co.
GRAYBAR ELECTRIC CO., INC.
HARNISCHEFER CORP.
International Combustion (Export) Ltd.
Loadking—see Yale & Towne Mfg. Co.
R & M—see Robbins & Myers, Inc.
Republic Steel Corp.
Robbins & Myers, Inc.
Yale and Towne Mfg. Co.

CHARGERS, BATTERY

ELECTRIC STORAGE BATTERY CO., THE EXIDE INDUSTRIAL DIV.
Fairbanks, Morse & Co.
General Electric Co., Apparatus Sales Div.
GOODMAN MANUFACTURING COMPANY, MANCHA STORAGE BATTERY LOCOMOTIVE DIV.
Gould-National Batteries, Inc.
GRAYBAR ELECTRIC CO., INC.
GREENSBURG MACH. CO.
Hobart Bros. Co.
International General Electric Co.
Lincoln-Electric Co.
Lister-Blackstone, Inc.
Lynn Engr. Supply Co.
Lynnco Powerhouse—see Lynn Engr. & Supply Co.
Motor Generator Corp.
Onan & Sons, Inc., D. W.
"Precision-charge"—see Lincoln Electric Co.
Sheppard Co., R. H.
SYNTRON CO.
Ward Leonard Electric Co.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Westinghouse Electric Corp.

CHEMICAL CONCENTRATORS

See Concentrating Equipment

CHEMICALS

See Reagents and Chemicals

CHIMNEYS

Consolidated Chimney Co.

CHUTES

See Bins, Chutes, and Accessories; Feeders

CLAMPS

See Couplings, hose; Rope, Wire

CLARIFIERS

See Filters, Concentrate; Thickeners and Tanks

CLASSIFIERS

See also Cyclones

AIR

Combustion Engineering Inc., Raymond Div.
Gayco-Reliance—see Universal Road Mach. Co.
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-Deutz, A. G.
International Combustion Ltd.
International Engr., Inc.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz A. G.
Majac, Inc.
McNally Pittsburgh Mfg. Co.
Osborne Pulso-cone—see Osborne Labs. Inc.
Roberts & Schaefer
Scott's Concentrators
Sturtevant Mill Co.
Universal Road Machinery Co.
Williams Patent Crusher & Pulverizer Co.

HYDRAULIC

Akins—see Mine & Smelter Supply Co., The
CONCENCO—SEE DEISTER CONCENTRATOR CO., THE
DEISTER CONCENTRATOR CO., THE
Deister Machine Co.
DENVER EQUIPMENT CO.
DORR OLIVER, INC.
Dresser Stacey Co.
Eagle Iron Works
EQUIPMENT ENGINEERS INC.
Fraser & Chalmers Engr. Wks.
Georgia Iron Wks.
Gibson, W. W.
HARDINGE CO., INC.
Heyl & Patterson, Inc.
KENNEDY-VAN SAUN MFG. & ENG.
Klockner-Humboldt-Deutz A. G.
KREBS—SEE EQUIPMENT ENG., INC.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE
Smith Engineering Works
TELLURIDE IRON WORKS CO.
WEMCO—SEE WESTERN MACH. CO.
WESTERN MACH. CO.
Wilmot Engineering Co.

MECHANICAL

AKINS—SEE COLORADO IRON WORKS CO.
Bird Machine Co.
Bodinson Mfg. Co.
COLORADO IRON WORKS CO.
DENVER EQUIPMENT CO.
DORR OLIVER, INC.
Fraser & Chalmers Engr. Wks.
General Electric Co. Ltd., The
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-Deutz, A. G.
Iowa Mfg. Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz A. G.
LINK-BELT CO.
Lippmann Engineering Works
Magnetic Engineering & Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Miners Foundry & Mfg. Co.
MORSE BROS. MACHINERY CO.
Roberts & Schaefer Co.
Smith Engineering Works

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SOUTHWESTERN ENGINEERING CO.
Straub Mfg. Co., Inc.
Sturtevant Mill Co.
TRULINE—SEE MORSE BROS. MACHINERY CO.
Union Iron Works
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.

CLEANERS

See Filters; Scrubbers

CLOTH

See Filter Media; Screens, Grizzlies and Accessories, Ventilation Equipment

CLOTHING

See Safety Equipment

CLUTCHES

MECHANISMS

Cutler-Hammer, Inc.
Dodge Mfg. Co.
LINK-BELT CO., EXPORT DIV.
Marland One-Way Clutch Co.
Morse Chain Co.
TWIN DISC CLUTCH CO.

FACING & LINING

See Friction Material

COLLECTORS

See Dust Collection Equipment; Reagents and Chemicals

COLUMNS

See Arms and Posts

COMMUNICATIONS

BELL AND BUZZER SYSTEMS

Adaptabel—see Edwards Co., Inc.
Adaptahorn—see Edwards Co., Inc.
Connecticut Telephone & Electric Corp.
Edwards Co., Inc.
GRAYBAR ELECTRIC CO., INC.
Lunger—see Edwards Co., Inc.
Signal Engr. & Mfg. Co.
Sterling Siren Fire Alarm Co., Inc.
United States Instrument Corp.

MINE TELEPHONES

Connecticut Telephone & Electric Corp.
Edwards Co., Inc.
GRAYBAR ELECTRIC CO., INC.
MINE SAFETY APPLIANCES CO.
SIMPLEX WIRE & CABLE CO.
Sterling Siren Fire Alarm Co., Inc.
United States Instrument Corp.

RADIO SYSTEMS

Alpine Laboratories, Ltd.
Connecticut Telephone & Electric Corp.
Fleetway—see Connecticut Telephone & Electric Corp.
GRAYBAR ELECTRIC CO., INC.
International General Electric Co.
International Geophysics, Inc.
MINE SAFETY APPLIANCES CO.
Motorola Communications & Electronics, Inc.
Sterling Siren Fire Alarm Co., Inc.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

TROLLEY TELEPHONES

MINE SAFETY APPLIANCES CO.
Sterling Siren Fire Alarm Co., Inc.

COMPRESSORS & ACCESSORIES

PORTABLE

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Atlas Copco, A. B. Sweden
Atlas Copco Eastern
ATLAS COPCO PACIFIC, INC.
Carrier Corp.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co.
Davey Compressor Co.
GARDNER-DENVER CO.
GOODMAN MFG. CO.
GYRO-FLOW—SEE INGERSOLL-RAND CO.
Holman Bros., Ltd. (England)
Holman Brothers (Canada) Limited
INGERSOLL-RAND CO.
Jaeger Machine Co., The
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air Brake Co.
Olin Mathieson Chem. Corp., Explosives Div.
Powermite Drill & Tool Co.
Schramm Inc.
UNTAIR—SEE JOY MANUFACTURING CO.
Westinghouse Air Brake Co., Le Roi Div.
Westinghouse Air Brake Co. (Pa.)
Worthington Corp.

STATIONARY

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Atlas Copco, A. B. Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
Carrier Corp.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Cooper-Bessemer Corp., The
DeLaval Steam Turbine Co.
GARDNER-DENVER CO.
Holman Bros., Ltd., (England)
Holman Brothers (Canada) Limited
INGERSOLL-RAND CO.
JAEGER MACHINE CO., THE
JOY MANUFACTURING CO.
Lima Electric Motor Co., The
Olin Mathieson Chem. Corp., Explosives Div.
RO-FLO—SEE ALLIS CHALMERS MFG. CO., INDUSTRIES GROUP
Roots-Connersville Blower Corp.
Schramm Inc.
Spiraxial—see Roots-Connersville Blower
Westinghouse Air Brake Co., Le Roi Div.
Worthington Corp.

CONCENTRATING EQUIPMENT

See also Classifiers; Flotation Machines, Magnetic Equipment

HEAVY MEDIA SEPARATION

AKINS—SEE MINE & SMELTER SUPPLY CO., THE
ATKINS—SEE COLORADO IRON WORKS CO.
ALLIS CHALMERS MFG CO., INDUSTRIES GROUP
COLORADO IRON WORKS CO.
Dings Magnetic Separator Co.
Dravo Corp.
Filter Fabrics, Inc.
Fraser & Chalmers Engr. Wks.
General Electric Co., Ltd., The
HARDINGE CO., INC.
HEWITT-ROBINS, INC.
Humboldt, Klockner-Humboldt-Deutz, A. G.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
Klockner-Humboldt-Deutz A. G.
LINK-BELT CO.
Magnetic Engineering & Mfg. Co.
McNally Pittsburgh Mfg. Co.
Memco—see Magnetic Engineering & Mfg. Co.
MINE & SMELTER SUPPLY CO.
MORSE BROS. MACH. CO.
O. C. C.—SEE ORE & CHEMICAL CO.
ORE & CHEMICAL CO.
Osborne Laboratories, Inc. Raymond G.
Simplicity Engineering Co.
Southwestern Engr. Co.
Stearns Magnetic, Inc.
STEARNS-ROGER MFG. CO., THE
TENNANT SONS & CO., C., OF N.Y.
WEMCO MOBILE-MILL—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.
Wilmot Eng. Co.

FANNING

Carpco Mfg. Co.

Ion Exchange Equipment

DENVER EQUIPMENT CO.
DORR-OLIVER CO.
Peterson Filters & Engineering Co.
SOUTHWESTERN ENGINEERING CO.
STANDARD STEEL CORP.
STEARNS-ROGER MFG. CO.
TYLER CO., W. S.
WESTERN MACHINERY CO.

JIGS

Bendelari, F. N.
Bodinson Mfg. Co.
Coeur d'Alene Hardware & Foundry Co.
DENVER EQUIPMENT CO.
Fraser & Chalmers Engr. Wks.
General Electric Co. Ltd., The
Hirsch Bros. Machy. Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
James Equipment Inc.
JEFFREY MANUFACTURING CO.
"Jimmy"—see James Equipment, Inc.
KENNEDY-VAN SAUN MFG. CO.
Knapp & Bates, Ltd.
Klockner-Humboldt-Deutz A. G.
LINK-BELT CO.
McLanahan & Stone Corp.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO.
Minera Foundry & Mfg. Co.
Osborne Laboratories, Inc., Raymond G.
Universal Dredge Mfg. Co.
WEMCO-REMER—SEE WESTERN MACHY. CO.
WESTERN MACHY. CO.
Wilmot Eng. Co.
Yuba Mfg. Co.

SPIRAL CONCENTRATORS

DENVER EQUIPMENT CO.
Fraser & Chalmers Engr. Wks.
General Electric Co., Ltd., The
HUMPHREYS INVESTMENT CO.
Jeffrey Mfg. Co.

TABLES

BUCKMAN TILING CONCENTRATOR — SEE DENVER EQUIP. CO.
Carpco Mfg., Inc.
CONCENCO—SEE DEISTER CONCENTRATOR CO., THE
DEISTERPLAT-O—SEE DEISTER CONCENTRATOR CO.
DEISTER CONCENTRATOR CO.
Deister Machine Co.
DENVER EQUIPMENT CO.
DURHAM MFG. & SALES CO., GORDON S.
Fraser & Chalmers Engr. Wks.
Gibson, W. W.
Humboldt, Klockner, Humboldt—Deutz, A.G.
James Equipment, Inc.
Klockner-Humboldt-Deutz, A. G.
Knapp & Bates, Ltd.
LINK-BELT CO., EXPORT DIV.
MINE & SMELTER SUPPLY CO.
Minerals et Metaux
Roberts & Schaefer Co.
Scott's Concentrators
Snyder Mine & Chemical Lab.
SUPER DUTY DIAGONAL—DECK—SEE DEISTER CONCENTRATOR CO.
Universal Dredge Mfg. Co.
WILFLEY—SEE MINE & SMELTER SUPPLY CO., THE
Yuba Manufacturing Co.

CHEMICAL CONCENTRATORS

Drullard Co., Howard
Humboldt, Klockner - Humboldt-Deutz, A. G.
KENNEDY-VAN SAUN MFG. & CO.
Klockner-Humboldt-Deutz, A.
Snyder Mine & Chemical Lab.
STEARNS—ROGER MFG CO.
WESTERN MACHY. CO.

CONCRETING EQUIPMENT, UNDERGROUND

See also Grouting, Pneumatic Concrete Placing

Air Placement Equip. Co.
Airplaco—see Air Placement Equip. Co.
Blaw-Knox Co.
Bondactor—see Air Placement Equip. Co.
CEMENT GUN CO.
Chain Belt Co.
CHICAGO PNEUMATIC TOOL CO.
Construction Mach. Co.
Grout-or Blast—see Air Placement Equip. Co.
GUNITE—SEE CEMENT GUN CO.
JAEGER MACHINE CO., THE
MAYO TUNNEL & MINE EQUIP.
Mix-elevator—see Air Placement Equip. Co.
Nueretor—see Air Placement Equip. Co.

CONDITIONERS

See Agitators and Conditioners

CONDUIT

See Cable and Conduit

CONSTRUCTION, MINE PLANT

See Plant Design and Construction

CONSULTING METALLURGICAL ENGINEERS

Hazen, H. L.
KEEGEL, C. P.
Krebs, Kellogg
Talbot, H. L.

CONSULTING MINING ENGINEERS AND SERVICES

Alderman, Jr., Sidney S.
Baukol, Philip J.
CHAPMAN AND WOOD
Cowin & Co., Inc.
Davis & Davis
Earle, Norton K.
Gardner, E. D.
Geo-Engineering
Geo-Professional Services, Inc.
GOULD & CO., GORDON I.
Ingersoll, Guy E.
JOHNSON, HERBERT BANKS
KEEGEL, C. P.
Lintz, Mark
LONGYEAR CO., E. J.
MacAfee & Co.
MEISSNER ENGRG. INC., J. F.
Miller, Arnold H.
Mineral Engineering Co. (Calif.)
O'Donnell & Schmidt
Pierce, Roger V.
Pinger, Allen W.
SMERCHANSKI, MARK G.
SCHROTER & LOCKWOOD
Shedwick, Jr., Wm. J.
Sherman, Howard P.
STILL & STILL
Uranium Exploration
Willey, C. R.
WISSER & COX
HARRY J. WOLF
World Mining Consultants Inc.

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CONTINUOUS MINERS

Goodman Mfg Co.
JEFFREY MFG CO.
JOY MFG. CO.
Scott's Concentrators
Westinghouse Air Brake Co., Le Roi Div.

CONTROL EQUIPMENT

See Testing, Recording, and Control Equipment

CONVERTERS

See Electrical Equipment; Pyrometallurgical Equipment, Transmissions

CONVEYOR EQUIPMENT

See also Scales and Feeders

BELTS

AMERICAN BRAKE SHOE CO., American Rubber Mfg. Co.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Barber-Greene Co.
Bear—see American Rubber Co.
Bodinson Mfg. Co.
Bonded Scale & Machine Co.
Boston Woven Hose & Rubber Co.
Carlyle Rubber Co., Inc.
Chain Belt Co.
Continental Gin Co.
Conveyor Co., The
Crackerjack—see American Rubber Co.
EQUIPMENT ENG. INC.
Gates Rubber Co.
Goodall Rubber Co.
Goodrich Co., B. F., Industrial Prod. Div.
Goodyear Tire & Rubber Co.
Gruendler Crusher & Pulverizer Co.
Haiss Mfg Co., ne., Geo.
HEWITT-ROBINS INC.
Homocord—see Raybestos-Manhattan, Inc.
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
Korb-Pettit Wire Fabrics & Iron Wks., Inc.
Lee Rubber & Tire Corp., Republic Rubber Div.
LINK-BELT CO.
Magnetic Engineering & Mfg. Co.
MAYO TUNNEL & MINE EQUIPMENT
McNalley Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Ogden Iron Works Co.
Porter Co., H. K., Quaker Rubber Co. Div.
Quaker Pioneer Rubber Mills
Quaker Rubber Co.—see Porter Co., H. K.
Raybestos-Manhattan, Inc.
Ray-man—see Raybestos-Manhattan Co.
Record-Maker—see Lee Rubber & Tire Corp., Republic Rubber Div.
Republic Rubber Div., Lee Rubber & Tire Corp.
Richardson Scale Co.
Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.
Stubbe, Albert
Super Excelo—see Lee Rubber & Tire Corp., Republic Rubber Div.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Thermoid Co.
Treadwell Co., Inc., M. H.
Trowbridge—see Magnetic Engineering & Mfg. Co.
United States Rubber Intl.
U. S. STEEL EXPORT CO.
Universal Engineering Corp.
Western Foundry Co.
Yuba Manufacuring Co.
Yosemite—see American Rubber Mfg. Co.

BUCKETS

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Barber-Greene Co.,
Bodinson Mfg. Co.
Chain Belt Co.
Christian Engineers, J. D.
Columbia Steel Casting Co., Inc.
Continental Gin Co.
Conveyer Co., The
Equipment Eng., Inc.
Gruendler Crusher & Pulverizer Co.
Hack Eng. Co.
HEWITT-ROBINS, INC.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz A. G.
Koehring Co., Johnson Co., C. S., a subsid.
LINK-BELT—SEE LINK-BELT CO.
LINK-BELT CO.
Lippmann Engineering Works
Magnetic Engineering & Mfg. Co.
McDowell Co., Inc.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
NATIONAL IRON CO.
Ogden Iron Works Co.
Owen Bucket Co., The
Pioneer Eng. Div., Poor & Co., Inc.
Rex—see Chain Belt Co.
Rogers Iron Works Co.
Sanford-Day Iron Works, Inc.
Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.
Stubbe, Albert
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Trowbridge—see Magnetic Engineering & Mfg. Co.
Thik-Lip—see Christian Engineers, J. D.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Watt Car & Wheel Co., The
Western Foundry Co.
Wilmot Engr. Co.
Yuba Manufacturing Co.

DRIVE AND TAIL PULLEYS

ACF Industries, Inc., American Car & Foundry Div.
Barber-Greene Co.
Bodinson Mfg. Co.
Chain Belt Co.
Christian Engineers, J. D.
Bonded Scale and Machine Co.
Continental Gin Co.
Conveyor Co., The
Dodge Manufacturing Corp.
Equipment Eng., Inc.
General Electric Co. Ltd., The
Gruendler Crusher & Pulverizer Co.
Haiss Mfg. Co., Inc., Geo.
HEWITT-ROBINS, Inc.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
JEFFREY MANUFACTURING CO.
JOY MANUFACTURING CO.
Klockner-Humboldt-Deutz A. G.
LINK-BELT CO.
Lippmann Engineering Works
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Ogden Iron Works Co.
Rogers Iron Works Co.
Smith Engineering Works
Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.
Stubbe, Albert
Taper-Lock—See Dodge Mfg. Co.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
Treadwell Co. Inc., M. H.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Wamsco—see Washington Mach. Co.
Washington Mach. Co.
Wedg-Grip—see Christian Engineers, J. D.
Western Foundry Co.
Yuba Manufacturing Co.

IDLERS

AMERICAN BRAKE SHOE CO. AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Barber-Greene Co.
Bodinson Mfg. Co.
Bonded—see Bonded Scale & Machine Co.
Bonded Scale & Machine Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co., Industrial Div.
Conveyor Co., The
Equipment Eng., Inc.
Fraser & Chalmers Engr. Wks.
General Electric Co., Ltd., The
Goodyear Tire & Rubber Co.
Gruendler Crusher & Pulverizer Co.
Hack Eng. Co.
Haiss Mfg. Co., Inc., Geo.
HEWITT-ROBINS, INC.
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
JEFFREY MANUFACTURING CO.
JOY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
LIMBEROLLER—SEE JOY MFG. CO.
LINK-BELT CO.
Lippmann Engineering Co., E. F.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL CO.
Ogden Iron Works Co.
Pettibone Muliken Corp.
Pioneer Engineering Div., Poor & Co., Inc.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Stubbe, Albert
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS
Treadwell Co., Inc., M. H.
Universal—see Hack Eng. Co.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Western Foundry Co.
Yuba Manufacturing Co.

PILLOW BLOCKS AND HANGERS

AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co., Industrial Div.
Conveyor Co., The
Dodge Manufacturing Corp.
Equipment Eng. Co.
General Electric Co. Ltd., The
Gruendler Crusher & Pulverizer Co.
Haiss Mfg Co., Inc., Geo.
HEWITT-ROBINS, INC.
Iowa Manufacturing Co.
JEFFREY MANUFACTURING CO.
LINK-BELT CO.
McNally Pittsburgh Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Ogden Iron Works Co.
S K F Industries, Inc.
SEALMASTER—SEE STEPHENS-ADAMSON MFG. CO.
SKOOKUM CO.
STEPHENS-ADAMSON MFG. CO.
Stubbe, Albert
TELLURIDE IRON WKS.
Universal Engineering Corp.
Western Foundry Co.
Yuba Manufacturing Co.

CONVEYORS AND ELEVATORS

See also Feeders

BELT CONVEYORS

AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
American Rubber Mfg. Co.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Athey Products Corp.
Barber-Greene Co.
Bodinson Mfg. Co.
Bonded Scale and Machine Co.
Boston Woven Hose & Rubber Co.
Butler Mfg. Co.
Carlyle Rubber Co., Inc.
Carpco Mfg. Inc.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Conveyor Co., The
Crackerjack—see American Rubber Mfg. Co.
DENVER EQUIPMENT CO.
Diamond Iron Works Div., Goodman Mfg. Co.
Fraser & Chalmers Engr. Wks.
Goodall Rubber Co.
GOODMAN MANUFACTURING CO.
Goodrich Co., B. F. Industrial Prod. Div.
Gruendler Crusher & Pulverizer Co.
Hack Eng. Co.
Haiss Mfg. Co., Inc., Geo.
HEWITT-ROBINS, INC.
HEWITT-ROBINS, INC. ROBINS CONVEYORS DIV.
Hirsch Bros. Machinery Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
Irwin Foundry & Mine Car Co.
JEFFREY MANUFACTURING CO.
JOY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CO.
Klockner-Humboldt-Deutz, A. G.
Korb—Pettit Wire Fabrics & Iron Works, Inc.
LAKE SHORE, INC.
Landis Steel Co.
Lee Rubber & Tire Corp., Republic Rubber Div.
LIMBEROPE—SEE JOY MFG. CO.
LINK-BELT CO.
Lippman Engineering Works
Magnetic Engineering & Mfg. Co.
MAYO TUNNEL & MINE EQUIP.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Miners Foundry Mfg. Co.
Ogden Iron Works Co.
OLIVER CORP., THE A. B. FARQUHAR DIV.
Pioneer Engineering Div., Poor & Co., Inc.
Pioneer Rubber Mills
Porter Co., Inc., H. K., Quaker Rubber Div.
Quaker Pioneer Rubber Mills
Quaker Rubber Co.
Raybestos-Manhattan, Inc.
READY—SPAN—SEE JOY MFG. CO.
Republic Rubber Div., Lee Rubber & Tire Corp.
Rogers Iron Works Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Sturtevant Mill Co.
TELLURIDE IRON WKS.
Thermoid Co.
Treadwell Co., Inc., M. H.
Trowbridge—see Magnetic Engineering & Mfg. Co.
United States Rubber Co.
United States Rubber Intl.
U. S. STEEL EXPORT CO.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
Yosemite—see American Rubber Mfg. Co.

BUCKET ELEVATORS

AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Barber-Greene Co.
Bodinson Mfg. Co.
Bonded Scale & Machine Co.
Butler Mfg. Co.
Carpco Mfg. Inc.
Chain Bel Co.
Christian Engineers, J. D.
Columbia Steel Casting Co., Inc.
Continental Gin Co., Industrial Div.
Conveyor Co., The
Diamond Iron Works Div., Goodman Mfg. Co.
Gruendler Crusher & Pulverizer Co.
Hack Eng. Co.
HEWITT-ROBINS, INC.
Hirsch Bros. Machinery Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
International Combustion (Export) Ltd.
Iowa Manufacturing Co.

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JEFFREY MANUFACTURING CO., THE
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
Klockner-Humboldt-Deutz, A. G.
Koehring Co., Johnson Co., C. S. a subsid.
LAKE SHORE, INC.
Landis Steel Co.
LINK-BELT CO.
Lippman Engineering Works
Magnetic Engineering & Mfg. Co.
McLanahan & Stone
Ogden Iron Works Co.
Pettibone Mulliken Corp.
Pioneer Engineering Div., Poor & Co., Inc.
Rogers Iron Works Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Sturtevant Mill Co.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Treadwell Co., Inc., M. H.
Trowbridge—see Magnetic Engineering & Mfg. Co.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
Wilmot Engineering Co.
Yuba Manufacturing Co.

SCREW

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
Bonded Scale & Machine Co.
Christian Engineers, J. D.
Continental Gin Co., Industrial Div.
Conveyor Co., The
Gruendler Crusher & Pulverizer Co.
Hevi-Ladge—see Christian Engineers, J. D.
Hirsch Bros. Machinery Co.
HOLOFLITE — SEE WESTERN PRECIPITATION CO.
Humboldt, Klockner - Humboldt-Deutz, A. G.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENGR. CORP.
Klockner-Humboldt-Deutz, A. G.
Koehring Co., Johnson Co., C. S.
Landis Steel Co.
LINK-BELT CO.
Lippmann Engineering Works
Miners Foundry & Mfg. Co.
Ogden Iron Works Co.
Pettibone Mulliken Corp.
Pioneer Engr. Div., Poor & Co., Inc.
Richardson Scale Co.
STEPHENS-ADAMSON MFG. CO.
Sturtevant Mill Co.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
WESTERN PRECIPITATION CO.

SHAKING OR VIBRATING

Bodinson Mfg. Co.
Bonded Scale & Machine Co.
Carpco Mfg. Inc.
Carrier Conveyor Corp.
Cleveland Vibrator Co., The
Continental Gin Co.
Conveyor Co., The
Fraser & Chalmers
General Electric Co., Ltd., The
GOODMAN MANUFACTURING CO.
Gruendler Crusher & Pulverizer Co.
Hack Eng. Co.
HEWITT-ROBINS, INC.
Humboldt, Kloekner - Humboldt-Deutz, A. G.
Internti Combustion (Export) Ltd.
JEFFREY MFG. CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Lippmann Engineering Works
Ogden Iron Works Co.
Simplicity Engr. Co.
Overstrom & Sons
SMIDTH & CO., F. L.
STEPHENS-ADAMSON MFG. CO.
SYNTRON CO.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Vulcan Iron Wks., Inc.
Watt Car & Wheel Co., The

STACKERS

JEFFREY MFG. CO.

COOLERS

See also Dryers & Kilns

ALLIS-CHALMERS MFG. CO.
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg Co.
Carrier Conveyor Corp.
Carrier Corp.
Christian Engineers, J. D.
Dravo Corp.
HARDINGE CO., INC.
HOLO-FLITE—SEE WESTERN PRECIPITATION CORP.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz A. G.
LINK-BELT CO.
Nichols Engineering & Research Corp.
NORDBERG MFG. CO.
Ogden Iron Works Co.
PACIFIC FOUNDRY CO., LTD.
Sarracco Tank & Welding Co.
SMIDTH & CO., F. L.
STANDARD STEEL CORP.
STEARNS ROGER MFG. CO.
TRAYLOR ENGR. & MFG. CO.
Washington Machinery Co.
WESTERN PRECIPITATION CORP.
WINDELER CO., LTD., GEORGE

COOLERS, MINE

Carrier Corp.

COOLING TOWERS

Carrier Corp.
Ogden Iron Works Co.
SANTA FE TANK DIV., FLOUR PRODUCTS CO.
WINDELER CO., LTD., GEO.

CORE BARRELS

DIAMOND DRILL CONTRACTING CO.
JOY MFG CO.
Mayhew Supply Co., Inc.
McClintock, R. S.

COUNTERS, GEIGER, OR SCINTILLATION

See Geiger Scintillation Counters

COUPLERS, CAR

AUTOMATIC—SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.
CARD IRON WORKS CO., THE C. S.
Coeur d'Alene Hardware & Foundry Co.
DIFFERENTIAL STEEL CAR CO.
EIMCO CORP., THE
Gregg Co., Ltd., The
Irwin Foundry & Mine Car Co.
MAYO AUTOMATIC—SEE MAYO TUNNEL & MINE EQUIP.
MAYO TUNNEL & MINE EQUIP.
Miners Foundry & Mfg. Co.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
Ohio Brass Co.
Sanford-Day Iron Works Inc.
Umeco—see Utility Mine Equipment Co.
Utility Mine Equipment Co.
WILLISON — SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.

COUPLINGS

See also Transmissions

HOSE

Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
Band-it Co.
Barco Mfg. Co.
Bodinson Mfg. Co.
Boston Woven Hose & Rubber Co.
CHICAGO PNEUMATIC TOOL CO.
CHIKSAN CO.
Cleveland Div., Westinghouse Air Brake Co.
Consolidated Pneumatic Tool Co., Ltd.
Gates Rubber Co.
Goodall Rubber Co.
Hose Accessories Co., Le-Hi Div.
Le Hi Champ—see Hose Accessories Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Pioneer Rubber Mills
Punch-Lok Co.
Thermoid Co.
Thor Power Tool Co.
Trabon Engineering Corp.
U. S. Rubber Intl.

PIPE

ATLAS COPCO PACIFIC, INC.
Bethlehem Steel Co.
Bodinson Mfg. Co.
CHIKSAN CO.
Food Machinery & Chem. Corp., John Bean Div.
Goodall Rubber Co.
Grinnell Co., Inc.
Gruvagrip—see Gustin-Bacon Mfg. Co.
Gruvajoint—see Gustin-Bacon Mfg. Co.
Gustin-Bacon Mfg. Co.
Industrial Coupler Co.
JOHNS-MANVILLE SALES CORP.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
National Supply Co. (Pa.)
Pacific Pipe Co.
Porter Co., Inc., H. K., W-S Fittings Div.
RING-TITE—SEE JOHNS-MANVILLE
Rolagrip—see Gustin-Bacon Mfg. Co.
Spang—see National Supply Co. (Pa.)
Taylor Forge & Pipe Works
Thor Power Tool Co.
Victaulic Co. of America
Walworth Co.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.

SHAFT & SHAFT FLEXIBLE

Airflex—see Falk Corp., The
Bodinson Mfg. Co.
BROWN, INC., DAVID
CHAIN BELT CO.
Continental Gin Co.
Dodge Mfg. Corp.
Falk Corp., The
Farrel-Bacon—see Farrel-Birmingham Co., Inc.
Farrel-Birmingham Co., Inc.
Fast's Self-aligning—see Koppers Co. Ind. Metal Prod. Div.
JEFFREY MANUFACTURING CO.
Koppers Co., Inc., Metal Prods. Div.
LINK-BELT CO.
Morse Chain Co.
Philadelphia Gear Wks., Inc.
Steelflex—see Falk Corp., The
Taper-Lock—see Dodge Mfg. Co.
Thomas Flexible Coupling Co.
Western Gear Corp. (S. F.)

CRANES

BRIDGE

American Chain & Cable Co. Wright Hoist Div.
American Hoist & Derrick Co., Crosby—Laughlin Div.
Bodinson Mfg. Co.
Dravo Corp.
EQUIPMENT ENG., INC.
Hack Engineering Co.
HARNISCHFEGER CORP.
Heyl & Patterson, Inc.
Ohio Hoist & Mfg. Co.
Pacific Coast Engr. Co.
Schoonmaker Co., Inc., P. G.
Shepard Niles Crane & Hoist Corp.
STEARNS-ROGER MFG CO.
THUNES MEK. VERKSTED. A. S.
UNITED STATES STEEL CORP., AMERICAN BRIDGES DIV.
Universal Dredge Mfg. Co.

JIB

American Chain & Cable Co., Wright Hoist Div
American Hoist & Derrick Co., Crosby-Laughlin Div.
Bodinson Mfg. Co.
Clyde Iron Wks., Inc.
Hack Engineering Co.
HARNISCHFEGER CORP.
Ohio Hoist & Mfg. Co.
Shepard Niles Crane & Hoist Corp.
THUNES MEK. VERSTED, A. S.
Yuba Mfg. Co.

TRUCK or TRACTOR MOUNTED

Allis-Chalmers Mfg. Co., Const. Machy. Div.
American Hoist & Derrick Co., Crosby-Laughlin Div.
BALDWIN-LIMA-HAMILTON CORP.
Bay City Shovels, Inc.
BUCYRUS ERIE CO.
CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
Clyde Iron Wks., Inc.
Crane Mobile—see Bay City Shovels, Inc.
Four Wheel Drive Auto Co., The
Garwood Industries, Inc.
HARNISCHFEGER CORP.
HIAB—SEE STANCO MFG. & SALES, INC.
HYDROCRANE—SEE BUCYRUS-ERIE CO.
Hyster Co.
INTERNATIONAL HARVESTER EXPORT CO.
INTERNATIONAL SUPERIOR—SEE INTERNATIONAL HARVESTER EXPORT CO.
Koehring Co.
LE TOURNEAU-WESTINGHOUSE ERIE CO.
Link Belt Speeder Corp.
LIMA—SEE BALDWIN-LIMA-HAMILTON CORP.
LORAIN—SEE THEW SHOVEL CO.
Manitowoc Eng. Corp.
MARION POWER SHOVEL CO.
MotoCranes—see Thew Shovel Co.
Northwest Eng. Co.
Ohio Hoist & Mfg. Co.
Pettibone Mulliken Corp.
Quick Way Truck Shovel Co.
Schield Bantam Co.
STANCO MFG. & SALES, INC.
THEW SHOVEL CO.
TRANSIT CRANE — SEE BUCYRUS-ERIE CO.
TOURNAPULL—SEE LE TOURNEAU-WESTINGHOUSE CO.
Uhrden, Inc.
Unit Crane & Shovel Corp.

CRUSHERS

See also Laboratory Equipment and Supplies

CONE

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bath Iron Wks. Corp.
Coeur d'Alene Hardware & Foundry Co.
Fraser & Chalmers
General Electric Co. Ltd., The
Humboldt, Klockner - Humboldt-Deutz, A. G.
HYDROCONE—SEE ALLIS CHALMERS MFG. CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz A. G.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
NORDBERG MANUFACTURING CO.
PENNSYLVANIA CRUSHER CO.
Smith Engineering Works
SYMONS—SEE NORDBERG MANUFACTURING CO.

GYRATORY

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bath Iron Wks. Corp.
Humboldt, Klockner - Humboldt-Deutz, A. G.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Kue-ken—see Straub Mfg. Co., Inc.
Klockner-Humboldt-Deutz A. G.
Lippmann Engineering Works
MASSCO—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
NORDBERG MFG. CO.
PENNSYLVANIA CRUSHER CO.
Smith Engineering Works
Straub Mfg. Co., Inc.
Sturtevant Mill Co.
SUPERIOR—SEE ALLIS CHALMERS MFG. CO.
SYMONS—SEE NORDBERG MANUFACTURING CO.
TRAYLOR ENGR. & MFG. CO.

HAMMER AND IMPACT

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Athey Prod. Corp.
Bath Iron Wks.
BRADFORD-BREAKER—SEE PENN. CRUSHER CO.
Combustion Engineering, Inc., Raymond Div.
Crusher Eng. Div., Poor & Co.
Diamond Iron Works Div., Goodman Mfg. Co.
Eagle Crusher Co.
Fraser & Chalmers
General Electric Co. Ltd., The
Gruendler Crusher & Pulverizer Co.
Hasemag of Germany
Humboldt, Klockner - Humboldt-Deutz, A. G.
International Combustion (Export) Ltd.
Iowa Manufacturing Co.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz A. G.
KNITTEL — SEE STEPHENS-ADAMSON MFG. CO.
Lippmann Engineering Works
MUDHOG—SEE JEFFREY MANUFACTURING CO., THE
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
NORDBERG MFG. CO.
PENNSYLVANIA CRUSHER CO.
Pioneer Eng. Div., Poor & Co., Inc.
Pettibone Mulliken Corp.
Pulva Corp.
PulvaSizer—see Pulva Corp.
PULVERATOR CO.—SEE ALLIS CHALMERS MFG. CO.
Rogers Iron Works Co.
Simplicity Engineering Co.
Smith Engineering Works
Sprout, Waldron & Co., Inc.
STEPHENS-ADAMSON MFG. CO.
Sturtevant Mill Co.
SYMONS—SEE NORDBERG MFG. CO.
THUNES MEK. VERSTED, A. S.
Universal—see Pettibone Mulliken Corp.
Williams Crusher & Pulverizer Co.

JAW

A-1—SEE ALLIS CHALMERS MFG. CO.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ALLOY STEEL & METALS CO.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BALDWIN - LIMA - HAMILTON CORP.
Bath Iron Wks. Corp.
Bico, Inc.
Birdsboro Steel Foundry & Machine Co.
Crusher Eng. Div., Poor & Co.
DFC—see Denver Fire Clay Co., The
DENVER EQUIP. CO.
Denver Fire Clay Co.
Diamond Iron Works Div., Goodman Mfg. Co.
Eagle Crusher Co.
Farrel-Bacon—see Farrel-Birmingham Co.
Farrel-Birmingham Co., Inc.
Fraser & Chalmers
General Electric Co. Ltd., The
Gibson, W. W.
Gruendler Crusher & Pulverizer Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
Iowa Manufacturing Co.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz A. G.
Kue-ken—see Straub Mfg. Co., Inc.
Lippmann Engineering Works
MASSCO—SEE MINE & SMELTER SUPPLY CO.
McLanahan & Stone Corp.
MINE & SMELTER SUPPLY CO.
NORDBERG MFG., CO.
PACIFIC—SEE ALLOY STEEL & METALS CO.
PENNSYLVANIA CRUSHER CO.
Pettibone Mulliken Corp.
Pioneer Engr. Div., Poor & Co., Inc.
Reliance—see Universal Road Machinery Co.
Rogers Iron Works Co.
Smith Engineering Works
Straub Mfg. Co., Inc.
Sturtevant Mill Co.
SYMONS—SEE NORDBERG MFG. CO.
TRAYLOR ENGINEERING & MFG. CO.
Universal—see Pettibone Mulliken Corp.
Universal Engineering Corp.
Universal Road Machinery Co.

ROLL

ACF Industries, Inc., American Car & Foundry Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bath Iron Wks. Corp.
Bonded Scale & Machine Co.
Combustion Engineering Inc.,—Raymond Div.
Crusher Eng. Div., Poor & Co.
DENVER EQUIPMENT CO.
Denver Fire Clay Co., The
Diamond Iron Works Div., Goodman Mfg. Co.
Exolon Co., The
FAIRMONT—SEE ALLIS CHALMERS MFG. CO.
FLEXROLL—SEE JEFFREY MANUFACTURING CO.
Fraser & Chalmers
Gatke Corp.
General Electric Co. Ltd., The
Gruendler Crusher & Pulverizer Co.
Gundlach Machine Co. Div. T. J. J. M. J. Industries, Inc.
Humboldt, Klockner - Humboldt-Deutz, A. G.
Iowa Manufacturing Co.
International Combustion (Export) Ltd.
International Eng., Inc.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz A. G.
LINK-BELT CO.
Lippmann Engineering Works
McLanahan & Stone Corp.
McNally Pittsburgh Mfg. Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Osborne Lab, Inc. Raymond G.
PENNSYLVANIA CRUSHER CO.
Pettibone Mulliken Corp.
Pioneer Engr. Div., Poor & Co., Inc.
Rogers Iron Works Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Sturtevant Mill Co.
TRAYLOR ENGINEERING & MFG. CO.
Union Iron Works Co.
Universal—see Pettibone Mulliken Corp.
Universal Engineering Corp.
Vulcan Patent Wks. Co. (Pa.)
Williams Patent Crusher & Pulverizer Co.
Wilmot Eng. Co.

CRUSHER PARTS

(Other than primary crusher manufacturers above)

Jaw and Cheek Plates

Columbia Steel Casting Co., Inc.
Crusher Eng. Div., Poor & Co.
ELECTRIC STEEL FOUNDRY CO.
Taylor-Wharton Iron & Steel Co.

CYCLONES

See also Classifiers

American Air Filter Co., Inc.
Buell Eng. Co., Inc.
CENTRICLONE — SEE DORR-OLIVER, INC.
Centrifugal & Mechanical Industries, Inc.
DORR-OLIVER
DORRCLONES — SEE DORR-OLIVER, INC.
Ducon Co.
Georgia Iron Wks.
EQUIPMENT ENG., INC.
HARDINGE CO., INC.
Heyl & Patterson, Inc.
Humboldt, Klockner - Humboldt-Deutz, A. G.
Johnson March Corp.
Klockner-Humboldt-Deutz, A. G.
NORTHERN BLOWER CO.
STANDARD STEEL CORP.
Telluride Iron Works Co.
WESTERN MACHY. CO.
Williams Patent Crusher & Pulverizer Co.
Wilmot Eng. Co.

CYLINDERS AND ACTUATORS

LEDEEN MFG. CO.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Inc. Products Div.

DIAMOND DRILL EQUIPMENT

See also BITS & DRILLS, ROCK

BOYLES BROS. DRILLING CO.
BOYLES BROS. DRILLING CO., LTD., (CANADA)
Diamond Drill Contracting Co.
Drilling Accessory & Mfg. Co., Ltd.
JOY MANUFACTURING CO.
LONGYEAR CO., E. J.
McClintock, R. S.
Pennsylvania Drilling Co.
SPRAGUE & HENWOOD, INC.

DIAMOND DRILLING

See Exploration Services

DIAMOND DRILLS

See Drills, Rock

DIAMONDS, INDUSTRIAL

American Coldset Corp.
Coldset—see American Coldset Corp.
DIAMOND TOOL RESEARCH CO., INC.
Havlick Diamond Drilling Co., Inc.
Koebel Diamond Tool Co.
LONGYEAR, E. J. CO.
McClintock Co., R. S.
SMIT & CO., INC., ANTON
Smit & Sons, Inc., J. K.
Snyders Mine & Chemical Lab.
SPRAGUE & HENWOOD, INC.
VAREL DIAMOND PRODUCTS CO.
Wheel Trueing Tool Co.

DIPPERS

See Buckets

DOORS, MINE

AMERICAN MINE DOOR COMPANY
CANTON—SEE AMERICAN MINE DOOR COMPANY
Coeur d'Alene Hardware & Foundry Co.
Gregg Co., Ltd.
Hirsch Bros. Machy. Co.

DRAFTING SUPPLIES

See Engineering Supplies and Drafting Equipment

DRAGLINES

See Excavators

DREDGES AND DREDGE BUCKETS

CONNECTED BUCKETLINE

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Columbia Steel Casting Co., Inc.
Drave Corp.
Taylor-Wharton Iron & Steel Co.
Universal Dredge Mfg. Co.
Washington Iron Works
Yuba Mfg. Co.

CUTTERHEAD (Hydraulic) see also Monitors

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
American Hoist & Derrick Co., Crosby-Laughlin Div.
American Steel Dredge Co., Inc.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Eagle Iron Works
ELECTRIC STEEL FOUNDRY CO.
Georgia Iron Works Co.
Hack Eng. Co.
Pacific Coast Engineering Co.,
Taylor-Wharton Iron & Steel Co.
Universal Dredge Mfg. Co.
Yuba Mfg. Co.

DRAGLINE DREDGE

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
ELECTRIC STEEL FOUNDRY CO.
Hack Eng. Co.
Maddox Foundry & Machine Works
Page Engr. Co.
Taylor-Wharton Iron & Steel Co.
Universal Dredge Mfg. Co.
Washington Iron Works
Yuba Mfg. Co.

DRIFTERS

See Drills, Rock

DRILLING CONTRACTORS

See Exploration Services

DRILL SHARPENERS

See Sharpeners, Rock Bit and Steel

DRILL STEEL

See Steel

DRILLS, ROCK

See also Diamond Drill Equipment

Air Exhaust Muffler

Allied Witan Co., Inc.

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AUGER DRILLS

ACKER DRILL COMPANY, INC.
Cardox Corp., Hardsoog Div.
Central Mine Equipment Co.
CHICAGO PNEUMATIC TOOL CO.
Coalmaster—see Central Mine Equipment Co.
Consolidated Pneumatic Tool Co., Ltd.
Failing Co., Geo. E.
Firth Sterling, Inc.
GARDNER-DENVER CO.
General Electric Co., Carboloy Dept.
Kerfmaster—see Central Mine Equipment Co.
LONGYEAR, E. J. Co.
Mayhew Supply Co.
McCarthy—see Salem Tool Co., The
MOBILE DRILLING, INC.
Rogers Iron Works Co.
Salem Tool Co., The
Thor Power Tool Co.
Vascoloy-Ramet Corp.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.

CHURN DRILLS

BUCYRUS-ERIE CO.
GARDNER-DENVER CO.
General Electric Co., Carboloy Dept.
Hillman Co., Inc., C. Kirk
HOSSFELD MFG. CO.
LONGYEAR CO., E. J.
Mills Iron Works, Inc.
MOBILE DRILLING INC.
SPANG & CO.
Westinghouse Air Brake Co., Le Roi Div.

CRAWLER MOUNTED DRILLS

Atlas Copco—see Atlas Diesel, A. B. Sweden
BUCYRUS-ERIE CO.
CHICAGO PNEUMATIC TOOL CO.
Drilling Accessory & Mfg. Co., Inc.
Failing Co., Geo. E.
GARDNER-DENVER CO.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Mayhew Supply Co.
MOBILE DRILLING INC.
PORTA-DRILL — SEE WINTER WEISS CO., THE
Reich Bros. Mfg. Co.
Thor Power Tool Co.
TRACDRILL—SEE JOY MFG. CO.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.
WINTER WEISS CO., THE

DIAMOND DRILLS

ACKER DRILL COMPANY, INC.
American Coldset Corp.
Atomic Eng. Corp.
BOYLES BROS. DRILLING CO.
BOYLES BROS. DRILLING CO., LTD. (CANADA)
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Damco—see Drilling Accessory & Mfg. Co., Inc.
DIAMOND DRILL CONTRACTING CO.
Drilling Accessory & Mfg. Co., Inc.
Du Jac Mfg., Co.
Failing Co., Geo. E.
General Electric Co., Carboloy Dept.
Havlick, J. L.
Holeycat—see Atomic Eng. Corp.
HITCHCOCK, LEO L.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.
Koebel Diamond Tool Co.
LONGYEAR CO., E. J.
McClintock Co., R. S.
Metal Carbides Corp.
MOBILE DRILLING INC.
Monarch Equipment Co.
Penndrill—see Pennsylvania Drilling Co.
Pennsylvania Drilling Co.
Porto Tool Co.
SPRAGUE & HENWOOD, INC.
Super Pioneer—see Diamond Drill Contracting Co.
TELLURIDE IRON WKS.
Wheel Trueing Tool Co.

GASOLINE DRILLS AND HAMMERS

ACKER DRILL CO.
Allied Geophysics
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
Atlas Copco, A. B. Sweden
Barco Manufacturing Co.
CHICAGO PNEUMATIC TOOL CO.
HOSSFELD MANUFACTURING CO.
PIONJAR—SEE STANCO MFG. & SALES, INC.
Porto Drill Co.
Powermite Drill & Tool Co.
STANCO MFG. & SALES, INC.
SYNTRON CO.

JET PIERCING DRILLS

BUCYRUS ERIE CO.
Carpco Mfg. Inc.
Linde Air Prod. Co.
MOBILE DRILLING INC.
Union Carbon & Carbide Corp., Linde Air Products Co., Div.

JUMBO AND BOOM ASSEMBLIES

See also Self Loading Transport

Atlas Copco, A. B. Sweden
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Drullard Co., Howard
GARDNER-DENVER CO.
Gismo—see Sanford Day Iron Wks.
HYDRO DRILL JIB—SEE JOY MANUFACTURING CO.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Landis Steel Co.
MAYO TUNNEL & MINE EQUIP. CO.
Minerals & Engr. Co., (Colo.)
MOBILE DRILLING INC.
Rogers Iron Works Co.
Sanford Day Iron Wks.
Thor Power Tool Co.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
WINTER WEISS CO., THE

PERCUSSION DRILLS

Drifters

Atlas Copco, A. B. Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
GARDNER-DENVER CO.
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div. Westinghouse Air Brake Co.
SILVER STREAK — SEE JOY MFG. CO.
Thor Power Tool Co.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.

SINKERS

Atlas Copco, A. B. Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
GARDNER-DENVER CO.
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air Brake Co.
Powermite Drill & Tool Co.
Schramm Inc.
SILVER STREAK — SEE JOY MFG. CO.
Spang & Co.
Thor Power Tool Co.
Westinghouse Air Brake Co., Le Roi Div.

SHOT DRILLS

ACKER DRILL COMPANY, INC.
Cardox Corp.
Consolidated Pneumatic Tool Co., Ltd.
Damco—see Drilling Accessory & Mfg. Co., Inc.
Drilling Accessory & Mfg. Co., Inc.
Failing Co., George E.
Mayhew Supply Co.
MOBILE DRILLING, INC.
Penndrill—see Pennsylvania Drilling Co.
Pennsylvania Drilling Co.
PORTA-DRILL — SEE WINTER-WEISS CO., THE
Reich Bros. Mfg. Co., Ine.
SPRAGUE & HENWOOD, INC.
Westinghouse Air Brake Co. (Pa.)
WINTER-WEISS CO., THE

STOPERS

Atlas Copco, A. B. Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Firth Sterling, Inc.
GARDNER-DENVER CO.
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air Brake Co.
SILVER STREAK — SEE JOY MFG. CO.
TELLURIDE IRON WKS.
Thor Power Tool Co.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.

ROTARY DRILLS

ACKER DRILL COMPANY, INC.
Allied Geophysics
BUCYRUS-ERIE CO.
Cardox Corp.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Damco—see Drilling Accessory Mfg. Co., Inc.
Drilling Accessory Mfg. Co., Inc.
Firth Sterling, Inc.
General Electric Co., Carboloy Dept.
Failing Co., Geo. E.
Hurricane—see Mayhew Supply Co.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Le Roi Div., Westinghouse Air Brake Co.
LONGYEAR CO., E. J.
Mayhew Supply Co.
MOBILE DRILLING INC.
Mott Core Drilling, Inc.
National Supply Co. (Pa.)
Penndrill—see Pennsylvania Drilling Co.
Pennsylvania Drilling Co.
PORTADRILL — SEE WINTER WEISS CO., THE
Porto Tool Co.
Powermite Drill & Tool Co.
Reich Bros. Mfg. Co.
Rogers Iron Works Co.
Schramm Inc.
Star Expansion Pacific, Inc.
Varel Mfg. Co.
Vascoloy-Ramet Corp.
Westinghouse Air Brake Co. (Pa.)
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.
WINTER WEISS CO., THE

WAGON DRILLS

Atlas Diesel, A. B., Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Drilling Accessory & Mfg. Co., Inc.
Firth Sterling Inc.
GARDNER-DENVER CO.
Holman Bros. (Canada) Ltd.
HOSSFELD MANUFACTURING CO.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.—
LE ROI DIV. WESTINGHOUSE AIR BRAKE CO.
Schramm Inc.
Thor Power Tool Co.
Westinghouse Air Brake Co., Le Roi Div.
Worthington Corp.

TRUCK, MOUNTED

Atomic Eng. Corp.
Damco—see Drilling Accessory & Mfg. Co., Inc.
Drilling Accessory & Mfg. Co., Inc.
DRILLMASTER — SEE INGERSOLL-RAND CO.
Failing, Geo. E.
Four Wheel Drive Auto Co., The
GARDNER-DENVER CO.
Holeycat—see Atomic Eng. Corp.
INGERSOLL-RAND CO.
JOY MFG. CO.
LONGYEAR CO., E. J.
Mayhew Supply Co.
MOBILE DRILLING, INC.
Minerals Eng. Co., (Colo.)
Mott Core Drilling Co.
National Supply Co. (Pa.)
PORTA-DRILL — SEE WINTER-WEISS CO., THE
Powermite Drill & Tool Co.
Reich Bros. Mfg. Co.
STANCO MFG. & SALES CO.
Westinghouse Air Brake Co., Le Roi Div.
Westinghouse Air Brake Co. (Pa.)
WINTER WEISS CO.

DRIVES, GEAR

See Gears

DRIVES

See Also Shaft Mounted Drives; Gears; Open Gearing

CHAIN

Bodinson Mfg. Co.
Chain Belt Co.
Dodge Mfg. Co.
B. F. Goodrich Co., Industrial Prod. Div.
Hirsch Bros. Machy. Co.
Ideal—see National Supply Co., (Pa.)
JEFFREY MFG. CO.
KENNEDY-VAN SAUN MFG. & ENG. CO.
LINK-BELT CO.
Morse Chain Co.
National Supply Co. (Pa.)
Ogden Iron Works Co.
Rex—see Chain Belt Co.
Yuba Mfg. Co.

FLATBELT

American Rubber Mfg. Co.
Bodinson Mfg. Co.
Continental Gin Co.
Gates Rubber Co., The
Hirsch Bros. Machy. Co.
Ogden Iron Works Co.
Quaker Pioneer Rubber Mills
U. S. Rubber Co.
U. S. Rubber Intl.
Western Gear Wks.
YUBA MFG. CO.

V BELTS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Bodinson Mfg. Co.
Continental Gin Co.
Dodge Mfg. Co.
Gates Rubber Co., The
Goodrich Co., B. F., Industrial Prod. Div.
Hirsch Bros. Machy. Co.
KENNEDY-VAN SAUN MFG. & ENG. CO.
LINK-BELT CO.
MAGIC GRIP—SEE ALLIS-CHALMERS MFG. CO.
Mosebach Electric & Supply Co.
National Supply Co. (Pa.)
Ogden Iron Works Co.
Quaker Pioneer Rubber Mills
Reeves Pulley Co.
Taper-Lock—see Dodge Mfg. Co.
TEXROPE—SEE ALLIS-CHALMERS MFG. CO.
U. S. Rubber Co.
U. S. Rubber Intl.
Western Gear Wks.
Yuba Mfg. Co.

DRYERS AND KILNS

See also Sintering Machines; Coolers

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
American Locomotive Co.
Bethlehem Steel Co.
Bodinson Mfg. Co.
BOOTH CO., INC., THE
BOOTH CONCENTRATE DRYER —SEE BOOTH CO., INC., THE
Carpco Mfg. Inc.
Carrier Conveyor Corp.
Centrifugal & Mechanical Industries, Inc.
Christian Engineers, J. D.
COLORADO IRON WORKS CO.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Combustion Engineering Inc., Raymond Div.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
Dravo Corp.
ELECTRIC STEEL FOUNDRY CO.
General American Transportation Corp.
General Machinery Co.
GOULD & CO., GORDON I.
HARDINGE CO., INC.
Hazemag of Germany
Hevi Duty Electric Co.
Heyl & Paterson, Inc.
Hold-Flite—see Christian Engineers, J. D.
HOLO-FLITE — SEE WESTERN PRECIPITATION CORP.
Humboldt, Klockner - Humboldt-Deutz, A. G.
Iowa Manufacturing Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Lowden—see Colorado Iron Works Co.
McLanahan & Stone Corp.
MINE & SMELTER SUPPLY CO.
Nichols Engineering & Research Corp.
NORDBERG MFG. CO.
Ogden Iron Works Co.
PACIFIC FOUNDRY CO., LTD.
Parry Dryer—see Silver Engineering Co.
Pollock Co., The William B.
Saracco Tank & Welding Co.
Silver Engineering Co.
SKINNER—SEE MINE & SMELTER SUPPLY CO.
SMIDTH & CO., F. L.
STANDARD STEEL CORP.
STEARNS, ROGER, MFG. CO.
TELLURIDE IRON WKS.
TRAYLOR ENG. & MFG. CO.
VULCAN IRON WORKS, PA.
Washington Machinery Co.
WESTERN PRECIPITATION CORP.

DUMPERS, MINE CAR

Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
CARD IRON WORKS CO., THE C. S.
Coeur d'Alene Hardware & Foundry Co.
Connellsville Mfg. & Mine Supply Co.
DIFFERENTIAL STEEL CAR CO.
Gregg Co., Ltd., The
Heyl & Patterson, Inc.
KAR-FLO—SEE LINK-BELT CO.
Koehring Co.
LAKE SHORE INC.
LINK-BELT CO.
McNally Pittsburgh Co.
Miners Foundry & Mfg. Co.
Nolan Co., The
Ogden Iron Works Co.
Pacific Car & Foundry Co.
Rogers Iron Wks.
TELLURIDE IRON WORKS
UNITED STATES STEEL EXPORT CO.
WELLMAN ENGINEERING CO.

DUST COLLECTION EQUIPMENT

Aeroturn—see Koppers Co. Inc., Metal Prod. Div.
American Air Filter Co.
American Blower Div. of American Standard
Buell Engineering Co., Inc.
Combustion Engineering Inc., Raymond Div.
COTTRELL — SEE WESTERN PRECIPITATION CORP.
DUALAIRE — SEE WESTERN PRECIPITATION CORP.
Ducon Co.
Dustube—see Wheelabrator Corp.
Fraser & Chalmers
General Electric Co. Ltd., The
Hazemag of Germany
Humboldt, Klockner - Humboldt-Deutz, A. G.
Iowa Manufacturing Co.
Johnson March Corp.
JOY MFG. CO.
Klockner-Humboldt-Deutz, A. G.
Koppers Co. Inc., Metal Prod. Div.
Majac Inc.
Markely Dust Control System, Inc.
MARTINDALE ELECTRIC CO.
MINE SAFETY APPLIANCES CO.
MULTICLONE—SEE WESTERN PRECPITATION CORP.
National Filter Media Corp.
NORBLO—SEE NORTHERN BLOWER CO., THE
NORTHERN BLOWER CO., THE
Research Cottrell, Inc.
Saracco Tank & Welding Co.
Sly Mfg. Co., The W. W.
Sturtevant Mill Co.
WESTERN PRECIPITATION CORP.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co. Le Roi Div.
Westinghouse Electric Corp.
Wheelabrator Corp.

ELECTRICAL EQUIPMENT

See also Magnetic Equipment; Locomotives; Batteries; Chargers; Welding Equipment, Supplies and Services; Hoisting Equipment; Communications; Winches; Cable and Conduit; Testing and Control Equipment

CABLE AND CONDUIT

See Cable and Conduit

DIESEL GENERATOR SETS

Allis-Chalmers Mfg. Co., Buda Div.
Caterpillar Tractor Co.
General Electric Co. Apparatus Sales Div.
Westinghouse Elec. Corp.

INSTRUMENTS

See Testing and Control Equipment

LIGHT PLANTS

Allis-Chalmers Mfg. Co., Buda
American Locomotive Co.
Cummins Engine Co., Inc.
Electro-Motive Power—see General Motors Corp., Electro-Motive Div.
Fairbanks, Morse & Co.
General Electric Co.
General Metals Corp., Enterprise Div.
General Motors Corp., Electro-Motive Div.
GM DIESEL—SEE GENERAL MOTORS OVERSEAS OPERATIONS
GENERAL MOTORS OVERSEAS OPERATIONS
GRAYBAR ELECTRIC CO., INC.
HARNISCHFEGER CORP.
Hobart—see Motor Generator Corp.
Homelite Corp.
Ideal Electric & Mfg. Co.
JOY-LITE—SEE JOY MFG. CO.
JOY MANUFACTURING CO.
Koehring Southern Co.
Kohler Co.
Lister-Blackstone, Inc.
Lynneo Powerhouse—see Lynn Engr. & Supply Co.
Lynn Eng. Co.
Motor Generator Corp.
NORDBERG MFG. CO.
Onan & Sons, Inc., D. W.
Power-Lite—see Lynn Eng. Co.
Ready Power Co.
Schoonmaker Co., Inc., P. G.
Sheppard Co., R. H.
STEARNS-ROGER MFG. CO.
Thor Power Tool Co.
Westinghouse Electric Corp.
Witte Engine Works, Oil Well Supply Div.

MOTOR MAINTENANCE EQUIP.

MARTINDALE ELECTRIC CO.

MOTORS, GENERATORS, AND CONVERTERS

Allis Co., The Louis
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AROS ELECTRIC, INC.
Caterpillar Tractor Co.
Connecticut Telephone & Electric Corp.
DELCO—SEE GENERAL MOTORS OVERSEAS OPERATIONS
Electric Machinery Mfg. Co.
Fairbanks, Morse & Co.
General Dynamics Corp., Electro Dynamic Div.
General Electric Co., Apparatus Sales Div.
General Electric Co., International
General Motors Corp., Electro-Motive Div.
General Metals Corp., Enterprise Div.
GENERAL MOTORS OVERSEAS OPERATIONS
GRAYBAR ELECTRIC CO., INC.
HARNISCHFEGER CORP.
Homelite Div., Textron, Inc.
Howell Electric Motors Co.
Ideal Electric & Mfg. Co.
Lima Electric Motor Co., The
Lincoln Electric Co.
Line-weld—see Lincoln Elec. Co.
Linde Air Products Co.
Lynn Eng. & Supply Co.
Master Electric Co., The
Miehle-Goss-Dexter, Inc., Star-Kimble Motor Div.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Mosebach Electric & Supply
R & M—see Robbins & Myers, Inc.
Reliance Electric & Engineering Co.
Robbins & Myers, Inc.
Schoonmaker Co., Inc., P. G.
Sterling Electric Motors, Inc.
Synerogear—see U.S. Electrical Motors, Inc.
Thor Power Tool Co.
Tri-Clad—see International General Electric Co.
Unicased—see U.S. Electrical Motors, Inc.
U.S. Electrical Motors, Inc.
Varidrive—see U. S. Electrical Motors, Inc.
Wagner Electric Corp.
Waukesha Motor Co.
Welco—see Wesche Electric Co.
Wesche Electric Co.
WESTINGHOUSE AIR BRAKE CO., LE ROI DIV.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Westinghouse Electric Corp.
Worthington Corp.

PACKAGE SUBSTATION

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
General Electric Co., Apparatus Sales Div.
General Electric Co., International
GRAYBAR ELECTRIC CO., INC.
International General Electric Co.
I-T-E Circuit Breaker Co.
Kulhman Electric Co.
Leonard Electric Co.
National Supply Co. (Pa.)
Schoonmaker Co., Inc., P. G.
Standard Transformer Co., The

TRANSFORMERS AND RECTIFIERS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AROS ELECTRIC, INC.
Carpco Mfg., Inc.
Cutler-Hammer, Inc.
Edwards Co., Inc.
Essex Wire Corp., Paranite Wire and Cable Div.
General Electric Co. Apparatus Sales Div.
General Electric Co., International
GRAYBAR ELECTRIC CO., INC.
Hillman Co. Inc., C. Kirk
International General Electric Co.
I-T-E Circuit Breaker Co.
Kulhman Electric Co.
Mosebach Electric & Supply Co.
Reliance Electric & Engineering Co.
Schoonmaker Co., Inc., P. G.
Standard Transformer Co.
SYNTRON CO.
Texas Instruments, Inc., (Dallas)
Wagner Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Westinghouse Electric Corp.
Weston Electrical Instrument Corp.

MISCELLANEOUS (CONDENSERS, RESISTORS, POTENTIOMETERS, ETC.)

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Cutler-Hammer, Inc.
EC&M Frequency Relay Control—see Electric Controller & Mfg. Co., The
EC&M Valimitor—see Electric Controller & Mfg. Co., The
Edwards Co., Inc.
Electric Controller & Mfg. Co., The
General Electric Co. Apparatus Sales Div.
General Electric Co., International
GRAYBAR ELECTRIC CO., INC.
Hillman Co., Inc., C. Kirk
Ideal Industries, Inc.
International General Electric Co.
JOY MANUFACTURING CO.
MARTINDALE ELECTRIC CO.
Micro-Switch Div. of Minneapolis-Honeywell Regulator Co.
Minneapolis-Honeywell Regulator Co., Indus. Div.
Mosebach Elec & Supply Co.
National Mine Service Co.
Ohio Carbon Co., The
Ohiohm—see Ohio Carbon Co., The
Rawson Electrical Instrument Co.
REGULEX—SEE ALLIS CHALMERS MFG. CO.
Revere Electric Manufacturing Co.
Rowan Controller Co.
RUPTAIR—SEE ALLIS CHALMERS MFG. CO.
Signal Engr. & Mfg. Co.
Superior Carbon Prod., Inc.
Texas Instruments, Inc. (Dallas)
Trombetta Solenoid Corp.
Ward Leonard Electric Co.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Weston Electrical Instrument Corp.

ENGINE EXHAUST CONDITIONERS, UNDERGROUND

OCM Catalytic Exhaust, OCM Dieseler Exhaust, OXY-Muffler Exhaust — see Oxy-Catalyst, Inc.
Oxy-Catalyst, Inc.
Ruth Co., The

ENGINEERING SERVICES

See Plant Design and Construction; Exploration Services; Consulting Mining Engineers

ENGINEERING SUPPLIES & DRAFTING EQUIPMENT

See also Surveying Instruments

Bausch & Lomb Optical Co.
Berger & Sons, Inc.
Dietzgen Co., Eugene
General Aniline & Film Corp., Ozalid A Div.
Geo-Optics Co., Inc.
Keuffel & Esser Co.
Lefax
Lufkin Rule Co.
Post Co., Frederick
Rocky Mountain Instrument Co.
Rotolite Co.
White Instrument Co., David
WILD HEERBRUGG INSTRUMENTS, INC.

ENGINES

See also Electrical Equipment

DIESEL AND SEMI-DIESEL

Alco Products, Inc.
Allis Chalmers Mfg. Co., Const. Machy. Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Allis-Chalmers Mfg. Co., Buda Co., The
American Locomotive Co.
AMERICAN M.A.R.C., INC.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

Baldwin-Lima-Hamilton Corp. Eddystone Div.
Caterpillar Tractor Co.
CHICAGO PNEUMATIC TOOL CO.
Continental Motors Corp.
Cooper-Bessemer Corp., The
Cummins Engine Co., Inc.
Diesel Energy Corp., Klockner-Humboldt-Deutz, A. G.
Enterprise Eng. & Mach. Co.
Fairbanks, Morse & Co.
General Metals Corp., Enterprise Div.
General Metals Corp., Enterprise Engine & Machinery Co.—a Subsid.
General Motors Corp., Detroit Diesel Engine Division
General Motors Corp.—Electro-motive Div.
GENERAL MOTORS OVERSEAS OPERATIONS
HALL-SCOTT MOTORS, INC.
HARNISCHFEGER CORP.
Hercules Motors Corp.
INGERSOLL-RAND CO.
International Harvester Co.
INTERNATIONAL HARVESTER EXPORT CO.
Klockner-Humboldt-Deutz, A. G.
Lister-Blackstone, Inc.
Minneapolis-Moline Co.
NORDBERG MFG. CO.
Onan & Sons, Inc., D.W.
P & H—SEE HARNISCHFEGER CORP.
Roder-Blackburn Intl. Corp.
Schoonmaker Co. Inc., P. G.
Sheppard Co., R. H.
Waukesha Motor Co.
WHITE MOTOR CO., THE
Witte Eng. Wks., Oil Well Supply Div.,
U. S. STEEL CO.
Worthington Corp.

GAS

Allis Chalmers Mfg. Co., Const. Machy. Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Allis-Chalmers Mfg. Co., Buda Div.
Caterpillar Tractor Co.
CHICAGO PNEUMATIC TOOL CO.
Continental Motor Corp.
Cooper-Bessemer Corp.
Cummins Engine Co., Inc.
Enterprise Eng. & Mach. Co.
Fairbanks, Morse & Co.
General Metals Corp. Enterprise Div.
HALL-SCOTT MOTORS, INC.
Hercules Motors Corp.
INGERSOLL-RAND CO.
International Harvester Co.
INTERNATIONAL HARVESTER EXPORT CO.
Klockner-Humboldt-Deutz, A. G.
Kohler Co.
Minneapolis-Moline Co.
NORDBERG MFG. CO.
Onan & Sons, Inc., D. W.
Waukesha Motor Co.
Westinghouse Air Brake Co., Le Roi Div.
Westinghouse Air Brake Co. (Pa.)
WHITE MOTOR CO., THE
Wisconsin Motor Corp.
Witte Eng. Wks. Oil Well Supply
U. S. STEEL CORP.
Worthington Corp.

GASOLINE

Allis-Chalmers Mfg. Co., Const. Machy. Div.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Allis-Chalmers Mfg. Co., Buda Co. Div.
Briggs & Stratton Corp.
Continental Motors Corp.
Fairbanks, Morse & Co.
G. M. C., Allison Div.
GENERAL MOTORS OVERSEAS OPERATIONS
HALL-SCOTT MOTORS, INC.
Hercules Motors Corp.
International Harvester Co.
INTERNATIONAL HARVESTER EXPORT CO.
Koehring Southern Co.
Kohler Co.
Le Roi Div., Westinghouse Air Brake Co.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Minneapolis-Moline Co.
National Supply Co., The, Engine Div.
Onan & Sons, Inc., D. W.
Turbo Jet—see G. M. C., Allison Div.
Turbo Prop—see G. M. C., Allison Div.
Waukesha Motor Co.
Westinghouse Air Brake Co., Le Roi Div.
Westinghouse Air Brake Co. (Pa.)
Wisconsin Motor Corp.
Witte Engine Works, Oil Well Supply Div., U. S. Steel Corp.

EXCAVATORS

See also Tractors and Attachments; Dredges and Dredge Buckets; Loaders; Monitors; Scrapers; Backhoes

American Brake Shoe Co.
American Hoist & Derrick Co., Crosby-Laughlin Div.
Bantam—see Schield Bantam Co.
Bay City Shovels, Inc.
BUCYRUS-ERIE CO.
CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
ELECTRIC STEEL FOUNDRY CO.
FASTBACK — SEE ELECTRIC STEEL FOUNDRY CO.
Gar Wood Industries, Inc.
HARNISCHFEGER CORP.
Hystaway—see Hyster Co.
Hyster Co.
Koehring Co.
Link Belt Speeder Corp.
LORAIN—SEE THEW SHOVEL CO.
Manitowoc Engr. Co.
MARION POWER SHOVEL CO.
Northwest Eng. Co.
Pence & Co., Inc., Earl H.
Quick-Way Truck Shovel Co.
Schield Bantam Co.
THEW SHOVEL CO.
Tractomotive Corp.
Unit Crane & Shovel Corp.
Westinghouse Air Brake Co., Le Roi Div.

CABLEWAYS

Slackline

CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
SAUERMAN BROS., INC.

CABLEWAYS

Tautline

CLARK EQUIP. CO., CONSTRUCTION MACH. DIV.
SAUERMAN BROS., INC.

DRAGLINES

Diesel

American Hoist & Derrick Co., Crosby-Laughlin Div.
BALDWIN - LIMA - HAMILTON CORP.
Bantam—see Schield Bantam Co.
Bay City Shovel Inc.
BUCYRUS-ERIE CO.
CLARK EQUIP CO., CONST. MACH. DIV.
Gar Wood Industries, Inc.
HARNISCHFEGER CORP.
Koehring Co.
LIMA — SEE BALDWIN-LIMA-HAMILTON CORP.
Link Belt Speeder Corp.
LORAIN—SEE THEW SHOVEL CO.
Manitowoc Eng. Co.
MARION POWER SHOVEL CO.
Northwest Eng. Co.
Page Eng. Co.
Quick Way Truck Shovel Co.
Schield Bantam Co.
THEW SHOVEL CO.
Unit Crane & Shovel Corp.

Electric

American Hoist & Derrick Co., Crosby-Laughlin Div.
Bantam—see Schield Bantam Co.
Bay City Shovels, Inc.
BUCYRUS-ERIE CO.
HARNISCHFEGER CORP.
Koehring Co.
Link Belt Speeder Corp.
MARION POWER SHOVEL CO.
Northwest Eng. Co.
Page Eng. Co.
Schield Bantam Co.
Unit Crane & Shovel Corp.

SCRAPERS, SELF-PROPELLED

ALLIS-CHALMERS MANUFACTURING CO., CONST. MACHY. DIV.
Beaumont—see Interntl Combustion (Export) Ltd.
Caterpillar Tractor Co.
CARRYALL — SEE LETOURNEAU-WESTINGHOUSE CO.
CLARK EQUIPMENT CO., CONST. MACH. DIV.
GENERAL MOTORS CORP., EUCLID DIVISION
GENERAL MOTORS OVERSEAS OPERATIONS
Gismo-see Sanford Day Iron Works, Inc.
International Combustion (Export) Ltd.
International Harvester Co.
Landis Steel Co.
LETOURNEAU-WESTINGHOUSE CO.
Rogers Iron Works Co.
Sanford Day Iron Wks.
TOURNAPULL—SEE LE TOURNEAU-WESTINGHOUSE CO.
Westinghouse Air Brake Co. (Pa.)
WESTINGHOUSE CO., LE TOURNEAU
Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc.

SHAFT MUCKERS—see Shaft Sinking

SHOVELS, POWER

Diesel

American Hoist & Derrick Co., Crosby-Laughlin Div.
BALDWIN - LIMA - HAMILTON CORP., LIMA - HAMILTON DIV.
Bantam—see Schield Bantam Co.
Bay City Shovels, Inc.
BUCYRUS-ERIE CO.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONST. MACH. DIV.
Clark Equipment Co.
Clyde Iron Works, Inc.
EIMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.
Gar Wood Industries, Inc.
HARNISCHFEGER CORP.
Koehring Co.
LIMA — SEE BALDWIN - LIMA-HAMILTON CORP.
Link-Belt Speeder Corp.
LORAIN—SEE THEW SHOVEL CO.
Manitowoc Engineering Corp.
MARION POWER SHOVEL CO.
MICHIGAN—SEE CLARK EQUIPMENT CO.
Northwest Engineering Co.
P & H—SEE HARNISCHFEGER CORP.
Quick-Way Truck Shovel Co.
Schield Bantam Co.
THEW SHOVEL CO.
Traxcavator—see Caterpillar Tractor Co.
Unit Crane & Shovel Corp.

Electric

American Hoist & Derrick Co., Crosby-Laughlin Div.
Bantam—see Schield Bantam Co.
Bay City Shovels, Inc.
BUCYRUS-ERIE CO.
EIMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.
GOODMAN MFG. CO
HARNISCHFEGER CORP.
Koehring Co.
Link-Belt Speeder Corp.
LORAIN—SEE THEW SHOVEL CO.
MARION POWER SHOVEL CO.
Northwest Engineering Co.
P & H—SEE HARNISCHFEGER CORP.
Schield Bantam Co.
THEW SHOVEL CO.
Unit Crane & Shovel Corp.

PARTS AND ATTACHMENTS

ALLOY STEEL & METALS CO.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
American Hoist & Derrick Co., Crosby-Laughlin Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BUCYRUS-ERIE CO.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONST. MACH. DIV.
COLORADO FUEL & IRON CORP.
EIMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.
Gar Wood Industries, Inc.
HARNISCHFEGER CORP.
Hensley Equip. Co.
Koehring Co.
MARION POWER SHOVEL CO.
Owen Bucket Co.
PACIFIC—SEE ALLOY STEEL & METALS CO.
Page Engineering Co.
Pence & Co., Inc., Earl H.
Quick-Way Truck Shovel Co.
R-Mor-see Vulcan Foundry Co.
Taylor Wharton Iron & Steel Co.
THEW SHOVEL CO.
Unit Crane & Shovel Corp.
Vulcan Foundry Co.
Westinghouse Air Brake Co., Ind. Products Div.
Westinghouse Air Brake Co., Le Roi Div.

EXPLORATION EQUIPMENT

See also Drills, Rock

Geochemical Equipment

Analytical Measurements, Inc.
Drullard Co., Howard
International Geophysics, Inc.
Menlo Research Lab.
Mobile Drilling, Inc.
Research Inc.

Geophysical Equipment

Allied Geophysics
Alpine Laboratories, Ltd.
Analytical Measurements, Inc.
Detectron Corp.
ELECTRO-TECHNICAL LABS.
Engineers Syndicate, Ltd.
Fisher Research Laboratory, Inc.
Geo-Optic Co., Inc.
Geophysical Specialties Co.
International Geophysics, Inc.
JOY MFG. CO.
La Roe Instruments, Inc.
LONGYEAR CO., E. J.
M-Scope—see Fisher Research Laboratory, Inc.
Menlo Research Lab.
MOBILE DRILLING, INC.
Mt. Sopris Inst. Corp.
Nucleonic Corp. of America
Precision Radiation Instruments, Inc.
Radiac Co., Inc., The
Research Inc.
Texas Instrument, Inc. (Dallas)
Texas Instruments, Inc., Industrial Instrumentation Div. (Houston)
Ultra-Violet Products, Inc.
United Geophysical Corp.
Uranium Enterprises
Victoreen Instrument Co.
Western Radiation Lab.
Westinghouse Electric Corp.
Whites' Electronics

ULTRA VIOLET LIGHTS

Mineralight—see Ultra Violet Prod., Inc.
Ultra Violet Prod., Inc.

EXPLORATION SERVICES

Aircraft

Aero Service Corp.
Aero Service Corp. (Mid-Continent)
Aero Service Corp. (Western)
African Surveys (Proprietary Ltd.)
BELL HELICOPTER CO.
Canadian Aero Service Ltd.
Engineers Syndicate, Ltd.
Porto Tool Co.
Rick Helicopters
World Wide Aerial Surveys (Aust.) Pty. Ltd.

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DRILLING

Churn

DIAMOND DRILL CONTRACTING CO.
International Geophysics, Inc.
Koebel Diamond Tool Co.
LONGYEAR CO., E. J.
McDonald, T. J.
Minerals Engineering Co., (Colo.)
Mott Core Drilling Co.
Pennsylvania Drilling Co.
SPANG & CO.
SPRAGUE & HENWOOD, INC.
World Mining Consultants, Inc.
Yuba Manufacturing Co.

Diamond

Allied Geophysics
BOYLES BROS. DRILLING CO.
BOYLES BROS. DRILLING CO. LTD. (CANADA)
DIAMOND DRILL CONTRACTING CO.
Du Jac Mfg. Corp.
Havlick, J. L.
HITCHCOCK MFG. CO., LEO
International Geophysics, Inc.
JOY MANUFACTURING CO.
Junction Bit & Tool Co.
LIVINGSTON & WILSON EXPLORATION & DRILLING CO.
LONGYEAR CO., E. J.
McClintock Co., R. S.
McDonald, T. J. (Colo.)
Minerals Engineering Co.
MOAB DRILLING CO.
MOBILE DRILLING, INC.
Mott Core Drilling Co.
Pennsylvania Drilling Co.
SMIT & CO., INC., ANTON
SPRAGUE & HENWOOD, INC.
St. Clair, John Q.
United Geophysical Corp.
World Mining Consultants, Inc.

Rotary

Allied Geophysics
Cardox Corp.
Exploration Drilling Co.
International Geophysics, Inc.
JOY MANUFACTURING CO.
LONGYEAR CO., E. J.
Minerals Engr. Co., (Colo.)
MOBILE DRILLING, INC.
Mott Core Drilling Co.
Pennsylvania Drilling Co.
Reich Bros. Mfg. Co.
St. Clair, John Q.
United Geophysical Corp.
World Mining Consultants, Inc.

SURVEYING

Aerial

Abrams Aerial Survey Corp.
Aero Service Corp.
Aero Service Corp. (Mid-Continent)
Aero Service Corp. (Western)
African Surveys (Proprietary Ltd.)
Canadian Aero Service Ltd.
CHAPMAN AND WOOD
ELLIOTT, D. H.
Fairchild Aerial Surveys Inc.
Geo-Optic Co., Inc.
Geoprofessional Services, Inc.
Hunting Associates, Ltd.
Hycon Aerial Surveys, Inc.
International Geophysics, Inc.
Laylander, Philip A.
LONGYEAR CO., E. J.
Lundberg Explorations, Ltd.
Minerals Exploration Research Corp.
Mott & Sons, Inc., B. H.
Permo Exploration Co.
Precision Radiation Instruments, Inc.
Radiac Company, Inc., The
Research, Inc.
Sloan, DBA & Associates
St. Clair, John Q.
STILL & STILL
Tracerlab, Inc.
Uranium Enterprises
Uranium Research & Devel Corp.
World Wide Aerial Surveys (Aust.) Pty. Ltd.

Geochemical

Drullard Co., Howard
International Geophysics, Inc.
LONGYEAR, CO., E. J.
Minerals Exploration Research Corp.
ORE RESEARCH & LABORATORIES
Radiac Company, Inc., The
Research, Inc.
STILL & STILL

Geological

Abrams Aerial Survey Corp.
Aero Service Corp.
Aero Service Corp. (Mid-Continent)
Aero Service Corp. (Western)
African Surveys (Proprietary Ltd.)
Bartell, A.O.
BOYLES BROS. DRILLING CO.
Canadian Aero Service Ltd.
CHAPMAN AND WOOD
Engineers Syndicate, Ltd.
Fairchild Aerial Surveys, Inc.
Fisher Research Laboratory, Inc.
Geo-Engineering
Geo-Optic Co., Inc.
Geoprofessional Services Inc.
Hulin, Carlton D.
International Geophysics, Inc.
KEEGEL, C. P.
Laylander, Philip A.
LONGYEAR CO., E. J.
M-Scope—see Fisher Research Laboratory, Inc.
Minerals Exploration Research Corp.
Mobile Drilling Inc.
MURPHY, F. M.
ORE RESEARCH & LABORATORIES
Peale, Rogers
Permo Exploration Co.
Precision Radiation Instruments, Inc.
Radiac Co Inc., The
Ray Drilling Co., Inc.
SCHROTER & LOCKWOOD
Shedwick, Jr., Wm. J.
St. Clair, John Q.
Stephenson, Robert C.
STILL & STILL
United Geophysical Corp.
Uranium Enterprises
Uranium Exploration
Uranium Research & Devel. Co.
WISSER & COX
World Mining Consultants, Inc.
World Wide Aerial Surveys (Aust.) Pty. Ltd.

Geophysical

Aero Service Corp.
Aero Service Corp. (Mid-Continent)
Aero Service Corp. (Western)
African Surveys (Proprietary Ltd.)
Allied Geophysics
Alpine Laboratories, Ltd.
Canadian Aero Service, Ltd.
Engineers Syndicate, Ltd.
Fairchild Aerial Surveys, Inc.
Fisher Research Laboratory, Inc.
Geo-Optic Co., Inc.
Geophysical Services, Inc.
Hunting Associates, Ltd.
International Geophysics, Inc.
LONGYEAR CO., E. J.
Lundberg Explorations, Ltd.
M-Scope—see Fisher Research Laboratory, Inc.
Minerals Exploration Research Corp.
Mobile Drilling, Inc.
Peale, Rogers
Precision Radiation Instruments, Inc.
Radiac Co., Inc., The
Research, Inc.
Seismograph Service Corp.
STILL & STILL
Texas Instruments, Inc. (Dallas)
Tracerlab, Inc.
United Geophysical Corp.
Uranium Enterprises
World Mining Consultants, Inc.
World Wide Aerial Surveys (Aust.) Pty. Ltd.

EXPLOSIVES

See Blasting Supplies

FANS

See Ventilation Equipment and Supplies

FASTENERS, BELT

Alligator—see Flexible Steel Lacing Co.
American Rubber Mfg. Co.
Armstrong-Bray & Co.
Crescent Belt Fastener Co., Inc.
Flexco—see Flexible Steel Lacing Co.
Flexible Steel Lacing Co.
General Electric Co. Ltd., The
Goodall Rubber Co.
Plategrip—see Armstrong-Bray & Co.
Steelgrip—see Armstrong-Bray & Co.
Talcott, Inc., W.O. & M.W.
Three Point Belt Lacing, Inc.

FEEDERS

ORE

Apron

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Barber-Greene Co., Inc.
Bodinson Mfg. Co.
Bonded Scale & Mach. Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Conveyor Co., The
DENVER EQUIPMENT CO.
Diamond Iron Works Div., Goodman Mfg. Co.
ELECTRIC STEEL FOUNDRY CO.
Fraser & Chalmers
General Electric Co., Ltd., The
Hack Engineering Co.
HARDINGE CO., INC.
Hirsch Bros. Machinery Co.
Humboldt, Kockner-Humboldt-Deutz, A. G.
Iowa Mfg. Co.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Dentz, A. G.
LINK-BELT CO.
Lippmann Engineering Works
McLanahan & Stone Co.
McNally Pittsburg Co.
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
NATIONAL IRON CO.
NORDBERG MFG. CO.
Ogden Iron Works Co.
Pettibone Mulliken Corp.
Pioneer Engineering Div., Poor & Co., Inc.
Rex—see Chain Belt Co.
Richardson Scale Co.
Rogers Iron Works Co.
ROSS SCREEN & FEEDER CO.
Smith Engineering Works
SOUTHWESTERN ENG. CO.
STEPHENS-ADAMSON MFG. CO.
Taylor-Wharton Iron & Steel Co.
Telluride Iron Wks.
Tisco—see Taylor-Wharton Iron & Steel Co.
TRAYLOR ENG. & MFG. CO.
Universal—see Pettibone Mulliken Corp.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.
Wilmot Engineering Co.

Belt

American Rubber Mfg. Co.
B. I. F. Industries, Inc.
Bear—see American Rubber Mfg. Co.
Bodinson Mfg. Co.
Bonded Scale and Machine Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Conveyor Co., The
Crackerjack—see American Rubber Mfg. Co.
DENVER EQUIPMENT CO.
Flexible Steel Lacing Co.
Fraser & Chalmers
Hack Eng. Co.
HARDINGE CO., INC.
HEWITT-ROBBINS, INC.
Hirsch Bros., Machinery Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
Iowa Mfg. Co.
JEFFREY MANLFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Dentz, A. G.
LINK-BELT CO.
Lippmann Engineering Works
McDowell Co., Inc.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Miners Foundry & Mfg. Co.
Ogden Iron Works Co.
Rex—see Chain Belt Co.
Richardson Scale Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
Straub Mfg. Co., Inc.
TELLURIDE IRON WORKS CO.
Thermoid Co.
Universal Dredge Mfg. Co.
Universal Road Mach.
Washington Machinery Co.

Chain

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
Chain Belt Co.
Christian Engineers, J. D.
Continental Gin Co.
Conveyor Co., The
ELECTRIC STEEL FOUNDRY CO.
Hack Eng. Co.
HARDINGE CO., INC.
Hirsch Bros. Machy. Co.
Humboldt, Klockner-Humboldt-Deuts, A. G.
JEFFREY MANUFACTURING CO.
Klockner-Humboldt-Dents A.G.
LINK-BELT CO.
Lippmann Engineering Works
Ogden Iron Works Co.
Rex—see Chain Belt Co.
ROSS SCREEN & FEEDER CO.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.
TELLURIDE IRON WORKS, CO.
Universal Dredge Mfg. Co.

Constant Weight

Bodinson Mfg. Co.
Conveyor Co., The
HARDINGE CO., INC.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
International Combustion, Ltd.
Link-Belt Co.
MERRICK SCALE MFG. CO.
POIDOMETER—SEE SCHAFFER POIDOMETER CO.
Richardson Scale Co.
SCHAFFER POIDOMETER CO.
Simplicity Engineering Co.
SYNTRON CO.
Washington Mach. Co.
WAYTROL—SEE JEFFREY MANUFACTURING CO., THE

RECIPROCATING

GOULD & CO., GORDON L.
LINK-BELT CO.

DISC

DEISTER CONCENTRATOR CO.
LINK-BELT CO.

Pan

Bodinson Mfg. Co.
Bonded Scale and Machine Co.
Chain Belt Co.
Christian Engineers, J. D.
Cleveland Vibrator Co., The
Continental Gin Co.
Conveyor Co., The
Diamond Iron Works Div., Goodman Mfg. Co.
ELECTRIC STEEL FOUNDRY CO.
Hack Eng. Co.
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
Iowa Mfg. Co.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Dentz, A. G.
LINK-BELT CO.
Lippmann Engineering Works
McLanahan & Stone
McNally Pittsburgh Co.
Miners Foundry & Mfg. Co.
NATIONAL IRON CO.
Ogden Iron Works Co.
Os-A-Veyor—see Simplicity Eng. Co.
Pioneer Engineering, Div. Poor & Co., Inc.
Rex—see Chain Belt Co.
Simplicity Engineering Co.
Smith Engineering Works
STEPHENS-ADAMSON MFG. CO.

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Straub Mfg. Co., Inc.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
Tisco—see Taylor-Wharton Iron & Steel & Co.
Universal Dredge Mfg. Co.
Universal Engineering Corp.
Washington Machinery Co.

REVOLVING

CONCENO—SEE DEISTER CONCENTRATOR CO.
DEISTER CONCENTRATOR CO.
LINK-BELT CO.

Table

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Bodinson Mfg. Co.
Chain Belt Co.
CONCENCO—SEE DEISTER CONCENTRATOR, CO.
DEISTER CONCENTRATOR CO.
General Electric Co. Ltd., The
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-Deutz, A. G.
JEFFREY MFG. CO., THE
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Pulva Corp.
TRAYLOR ENG. & MFG. CO.

REAGENT

Bodinson Mfg. Co.
Clarkson Co., The
Com-Bin—see Pulva Corp.
DENVER EQUIPMENT CO.
EQUIPMENT ENGINEERS INC.
Feedorator—see Fischer & Porter Co.
Fischer & Porter Co.
GALIGHER CO., THE
GEARY—SEE GALIGHER CO., THE
GEARY JUNIOR—SEE GALIGHER CO., THE
Gibson, W. W.
Humboldt, Klockner-Humboldt-Deutz, A. G.
JEFFREY MANUFACTURING CO.
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
MASSCO-ADAMS—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
Minerals et Metaux
WESTERN MACHY. CO.

VIBRATING

BIN-DICTATOR CO., THE
Carrier Conveyor Corp.
LINK-BELT CO.
Simplicity Eng. Co.
SYNTRON CO.

FILTER MEDIA

American Air Filter Co. Inc.
Burwell—see Minerals Eng. Co.
CELITE—SEE JOHNS-MANVILLE
Cleveland Wire Cloth & Mfg. Co., The
Dicalite Div., Great Lakes Carbon Corp.
DORR-OLIVER INC.
EIMCO CORP., THE
Feon—see Filtration Engineers Inc.
Filteration Engineers, Inc.
Filter Fabrics, Inc.
JOHNS-MANVILLE SALES CORP.
Ludlow-Saylor Wire Cloth Co.
National Filter Media Corp.
NFM—see National Filter Media Corp.
Pendleton Woolen Mills

FILTERS

AIR

American Air Filter Co., Inc.
Bemis Bro. Bag Co.
CHICAGO PNEUMATIC TOOL CO.
DriAir—see New Jersey Meter Co.
Ducon Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
International Combustion (Export) Ltd.
Johnson March Corp.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
MINE SAFETY APPLIANCES CO.
New Jersey Meter Co.
Saracco Tank & Welding Co.
Staplex Co., The
Thor Power Tool Co.
ULTRA-AIRE—SEE MINE SAFETY APPLIANCES CO.
Westinghouse Air Brake Co., Ind. Products Div.
Westinghouse Electric Corp., Sturtevant Div.

CONCENTRATE

AMERICAN—SEE DORR-OLIVER INC.
BEE-TEE—SEE GALIGHER CO., THE
Bemis Bros. Bag Co.
Bird Machine Co.
Buck & Associates, Carl
Burt—see Mine & Smelter Supply Co.
DENVER EQUIPMENT CO.
DORR-OLIVER INC.
DORRCO—SEE DORR-OLIVER, INC.
EIMCO CORP., THE
Feino—see Filtration Engineers, Inc.
Filtration Engineers, Inc.
GALIGHER CO., THE
General American Transportation Corp.
HARDINGE CO., INC.
Hirsch Bros. Machy. Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
International Combustion Ltd.
KELLY — SEE DORR-OLIVER, INC.
MINE & SMELTER SUPPLY CO.
MORSE BROS. MACHINERY CO.
OLIVER — SEE DORR-OLIVER, INC.
Peterson Filters & Engineering Co.
Saracco Tank & Welding Co.
SWEETLAND — SEE DORR-OLIVER, INC.

OIL

DORR-OLIVER, INC.
Filpro—see U. S. Hoffman Machy. Co.
Roder Blackburn International Corp.
Saracco Tank & Welding Co.
Schoonmaker Co. Inc., P. G.
Tamping Bag Co., The
Thor Power Tool Co.
U. S. Hoffman Machinery Corp.
Winslow-Weld—see Winslow Eng. & Mfg. Co.
Winslow & Mfg. Engineering Co.

FIRE BRICKS

See Also Refractories

BABCOCK & WILCOX CO., THE
JOHNS-MANVILLE SALES CORP
Kaiser Aluminum & Chem. Corp.
Mexico Refractories Co.
Utah Fire Clay Co.

FIRST AID SUPPLIES

See Safety Equipment

FLOTATION MACHINES

AGITAIR—SEE GALIGHER CO., THE
BOOTH CO., INC.
FAGERGRENS & STEFFENSENS—SEE WESTERN MACHINERY CO.
Fraser & Chalmers
GALIGHER CO., THE
Humboldt, Glockner-Humboldt-Deutz, A. G.
JETAIR—SEE MORSE BROS., MACHINERY CO.
Klockner-Humboldt-Deutz, A. G.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Minemet—see Minerals et Metaux
Minerals et Metaux
MORSE BROS. MACHINERY CO.
STEARNS ROGER MFG. CO.
U. S. Hoffman Mach. Corp.
WEMCO-FAGERGREN—SEE WESTERN MACH. CO.
WESTERN MACHINERY CO.
Westinghouse Electric Corp., Sturtevant Div.

FLOTATION REAGENTS

See Reagents and Chemicals

FRAMERS

See Saws, Power

FRICTION MATERIAL

Gatke Corp.
JOHNS-MANVILLE SALES CORP.
Thermoid Co.
Tool Steel Gear & Pinon Co.
Wagner Electric Corp.
Wellman Co., S.K.

FURNACES

See Pyrometallurgical Equipment

FUSE

See Blasting Equipment

GATES

See Bins, Chutes and Accessories

GAUGES

Air Reduction Sales Co.
ALDON CO.
Beckman Instruments, Inc.
Bristol Co., The
Foxboro Co., The
General Electric Co., International
Lufkin Rule Co.
Lunkenheimer Co., The
Matheson Co., Inc.
Minneapolis-Honeywell Regulator Co.
Norwood Controls Unit
Weston Electrical Instrument Corp.

GEAR MOTORS

See Motors

GEARS

See also Speed Changers; Open Gearing; Drives; Shaft Mounted Drives

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
BROWN, INC., DAVID
Christian Engineers, J. D.
Cleveland Worm & Gear Co., The
Coeur d'Alene Hardware & Foundry Co.
Columbia Steel Casting Co. Inc.
Conveyor Co., The
Dodge Mfg. Corp.
Falk Corp., The
Farrel-Birmingham Co., Ins.
Gatke Corp.
General Electric Co., International
HEWITT-ROBINS, INC.
JEFFREY MANUFACTURING CO.
LINK-BELT CO.
Ohio Gear Co.
Philadelphia Gear Works, Ins.
Schoonmaker Co. Inc., P. G.
STEARNS-ROGER MFG. CO., THE
Taylor-Wharton Iron & Steel Co.
Tool Steel Gear & Pinion Co., The
Universal Gear Works, Inc.
Vulcan Iron Works, (Pa.)
Western Foundry Co.
Western Gear Corp. (Calif.)
Western Gear Corp. (Wash.)
Western Gear Corp.—Pacific Gear Plant
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Worthington Corp.
Yuba Manufacturing Co.

GEIGER & SCINTILLATION COUNTERS

See also Exploration Equipment

Allied Geophysics
Alpine Laboratories, Ltd.
Atomic Engineering Corp.
Babbel—see Uranium Eng. Co.
Braun-Knecht-Heimann Co.
COLORADO ASSAYING CO.
Custom—see Precision Radiation Instruments
De Luxe—see Precision Radiation Instruments
Detectron Corp.
Eberline Inst. Div., Reynolds Elect. & Eng. Co.
ELECTRO-TECHNICAL LABS.
El-Tronics, Inc.
Engineers Syndicate, Ltd.
Fisher Research Lab., Inc.
Gammocat—see Atomic Engineering Corp.
General Electric Co., International
Junction Bit & Tool Co.
La Roe Instruments, Inc.
Menlo Research Lab.
Mt. Sopris Inst. Corp.
Nuclear-Chicago Corp.
Nucleonic Corp. of America
Philips Electronics, Inc., Instruments Div.
Pick Laboratories
Precision Radiation Instruments, Inc.
Professional—see Precision Radiation Inst.
Radiac Co., Inc., The
Snooper—see Precision Radiation Inst.
Snyders Mine & Chemical Lab.
Special—see Precision Radiation Inst.
Standard—see Precision Radiation Inst.
Technical Associates
Tracerlab, Inc.
Universal Atomics
Uranium Engr. Co.
Uranium Enterprises
Ultra Violet Prod., Inc.
Victoreen Instrument Co.
Western Radiation Lab.

GENERATORS

See Electrical Equipment

GEOPHYSICAL SURVEYS

See Exploration Services

GIANTS

See Monitors

GRADERS

ADAMS-SEE LE TOURNEAU-WESTINGHOUSE CO.
Allis-Chalmers Manufacturing Co., Const. Machy. Div.
Caterpillar Tractor Co.
Haiss Mfg. Co., Inc.
HUBER WARCO CO.
LE TOURNEAU-WESTINGHOUSE CO.
Pettibone Mueliken Corp.
Speedgrader—see Pettibone Mulliken Corp.

GRINDERS

See Sharpeners, Rock Bit

GRINDING EQUIPMENT

BALL MILLS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
ALLISON STEEL MFG. CO.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BABCOCK & WILCOX CO.
BALLPEB—SEE ALLIS-CHALMERS MFG. CO.
Coeur d'Alene Hardware & Foundry Co.

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COMPEB—SEE ALLIS-CHALMERS MFG. CO.
DENVER EQUIPMENT CO.
Dravo Corp.
EIMCO CORP., THE
Foster Wheeler Corp.
Fraser & Chalmers Eng. Wks.
GALIGHER CO.
HARDINGE CO., INC.
Hirsch Bros. Machinery Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
International Combustion, Ltd.
International Engr., Inc.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
LAKE SHORE, INC.
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
McNally Pittsburg Co.
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
MORSE BROS. MACHINERY CO.
NORDBERG MFG. CO.
Rib-Cone—see Straub Mfg. Co., Inc.
SMIDTH & CO., F. L.
STEARNS ROGER MFG. CO.
Straub Mfg. Co., Inc.
THUNES MEK. VERKSTED, A. S.
TRAYLOR ENG. & MFG. CO.
Union Iron Works

BALLS

ACF Industries, Inc., American Car & Foundry Div.
ALLIS-CHALMERS MFG. CO.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
American Brake Shoe Co.
American Forge Co.
BABCOCK & WILCOX CO., THE
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
C F & I—SEE COLORADO FUEL & IRON CORP., THE
Calumet & Hecla, Inc., Calumet Div.
Coeur d'Alene Hardware & Foundry Co.
COLORADO FUEL & IRON CORP., THE
CONCAVEX—SEE ALLIS CHALMERS MFG. CO.
Firth Sterling, Inc.
HARDINGE CO., INC.
International Combustion Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
MARCY—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
Ni Hard—see Calumet & Hecla, Inc., Calumet Div.
SHEFFIELD STEEL DIV., ARMCO STEEL CORP.
S K F Industries, Inc.
U. S. STEEL CORP., COLUMBIA-GENEVA STEEL DIV.
USS—SEE U. S. STEEL CORP.
UNITED STATES STEEL EXPORT CO.
Western Foundry Co.

PEBBLE MILLS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
DENVER EQUIPMENT CO.
Dravo Corp.
EIMCO CORP., THE
Fraser & Chalmers Engr. Wks.
General Electric Co. Ltd., The
HARDINGE CO., INC.
Klockner-Humboldt-Deutz, A. G.
International Combustion Ltd.
International Engr. Inc.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
MARCY—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
NORDBERG MANUFACTURING CO.
Saracco Tank & Welding Co.
SMIDTH & CO., F. L.
STEARNS-ROGER MFG. CO
Straub Mfg Co., Inc.
THUNES MEK. VERKSTED, A. S.
TRAYLOR ENG. & MFG. CO.
U. S. STEEL CORP.

ROD MILLS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
BETHLEHEM PACIFIC COAST STEEL CORP.
COLORADO FUEL & IRON CORP.
DENVER EQUIPMENT CO.
Dravo Corp.
EIMCO CORP., THE
General Electric Co. Ltd., The
Gibson, W. W.
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-Deutz, A. G.
International Combustion Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
MARCY—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
MORSE BROS. MACHINERY CO.
NORDBERG MFG. CO.
STEARNS ROGER MFG. CO.
THUNES MEK. VERKSTED, A. S.
TRAYLOR ENG. & MFG. CO.

RODS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Export Corp.
C F & I—SEE COLORADO FUEL & IRON CORP., THE
COLORADO FUEL & IRON CORP.
HARDINGE CO., INC.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
MINE & SMELTER SUPPLY CO.
Saracco Tank & Welding Co.
SHEFFIELD STEEL DIV., ARMCO STEEL CORP.
U. S. STEEL CORP., COLUMBIA-GENEVA STEEL DIV.

TUBE MILLS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Dravo Corp.
EIMCO CORP., THE
General Electric Co. Ltd., The
HARDINGE CO., INC.
Humboldt, Klockner-Humboldt-Deutz, A. G.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
LAKE SHORE, INC.
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
NORDBERG MFG. CO.
Saracco Tank & Welding Co.
SMIDTH & CO., F. L.
Straub Mfg. Co., Inc.
THUNES MEK. VERKSTED, A. S.
TRAYLOR ENG. & MFG. CO.

LINERS

ALLIS-CHALMERS MFG. CO.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Calumet & Hecla, Inc., Calumet Div.
Coeur d'Alene Hardware & Foundry Co.
Columbia Steel Casting Co., Inc.
DENVER EQUIPMENT CO.
EIMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.
Gathe Corp.
Georgia Iron Works
HARDINGE CO., INC.
International Combustion, Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
MINE & SMELTER SUPPLY CO.
Miners Foundry & Mfg. Co.
NATIONAL MALLEABLE & STEEL CASTING CO.
Ni-Hard—see Calumet & Hecla, Inc. Calumet Div.
Sanford-Day Iron Works Inc.
SMIDTH & CO., F. L.
Straub Mfg. Co., Inc.
Taylor-Wharton Iron & Steel Co.
TRAYLOR ENG. & MFG. CO.
USS—SEE U.S. STEEL CORP.
UNITED STATES STEEL EXPORT CO.
U.S. STEEL CORP., COLUMBIA-STEEL DIV.
Washington Iron Works
Western Foundry Co.
Pulverizers
Majac, Inc.

GRIZZLIES

See Screens, Grizzlies and Accessories

GROUTING

See also Concreting Equipment

EQUIPMENT

Air Placement Equip. Co.
Air Placo — see Air Placement Equip. Co.
CEMENT GUN CO.
DIAMOND DRILL CONTRACTING CO.
Dravo Corp.
Grout-or Blast—see Air Pacement Equip. Co.
Koehring Co.
LONGYEAR CO., E. J.
MAYO TUNNEL & MINE EQUIP. MENT MOBILE DRILLING, INC.
MORSE BROS. MACHINERY CO.
Pendrill—see Pennsylvania Drilling Co.
Pennsylvania Drilling Co.
SPRAGUE & HENWOOD, INC.

SERVICES

DIAMOND DRILL CONTR. CO.
McClintock Co.
Minerals Engr. Co.
MOBILE DRILLING, INC.

HARD FACING

See Welding Equipment and Supplies

HATS

See Safety Equipment

HAULAGE UNITS, OFF-RAIL

See also Truck and Trailers, Self Loading Transport

Allis-Chalmers Mfg. Co., Construction Machy. Div.
Autocar—see The White Motor Co., Autocar Trucks Div.
Dart Truck Co.
Easton Car & Construction Co.
EUCLID DIVISION, GENERAL MOTORS CORP.
Federal Motor Truck Co.
Four Wheel Drive Auto Co., The
Fruehauf—see Fruehauf Trailer Co.
Fruehauf Trailer Co.
Galion Allsteel Body Co.
GENERAL MOTORS CORP., EUCLID DIV.
GENERAL MOTORS OVERSEAS OPERATIONS
GETMAN BROTHERS
GETMAN SHUTTLE CARS—SEE GETMAN BROS.
Gismo—see Sanford Day Iron Works, Inc.
GOODMAN MFG. CO.
Heil Co., The
Howe Scale Co.
International Harvester Co.
JOY MANUFACTURING CO.
KENWORTH MOTOR TRUCK CO.
Koehring Co.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE CO.
Napco Industries, Inc.
Sanford-Day Iron Works, Inc.
SCOOT-CRETE—SEE GETMAN BROS. MFG. DIV., INC.
TOURNAHOPPER—SEE LE TOURNEAU-WESTINGHOUSE CO.
TOURNAPULL—SEE LE TOURNEAU-WESTINGHOUSE CO.
TOURNAROCKER—SEE LE TOURNEAU-WESTINGHOUSE CO.
Westinghouse Air Brake Co., Le Roi Div.
White Motor Co., Autocar, Trucks Div.
Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc.

HEADFRAMES

STEEL

ALLISON STEEL MFG. CO.
Connellsville Mfg. & Mine Supply Co.
Hack Eng. Co.
Humboldt, Klockner-Humboldt-Deutz, A. G.
LAKE SHORE, INC.
MAYO TUNNEL & MINE EQUIP.
NATL. IRON CO.
Silent Glow Oil Burner Corp.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Washington Iron Wks.

Timber

Koppers Co., Inc.

HEATERS

AIR

American Air Filter Co., Inc.
Carrier Corp.
Cutler-Hammer, Inc.
Dravo Corp.
Foster Wheeler Corp.
General Electric Co., Apparatus Sales Div.
General Electric Co., International
GRAYBAR ELECTRIC CO., INC.
Grinnell Co., Inc.
International Combustion Ltd.
Klockner-Humboldt-Deutz, A. G.
Saracco Tank & Welding Co.
Silent Glow Oil Burner Corp.
Thermolier—see Grinnell Co., Inc.
USCO—see International Combustion Ltd.
Vulcan Electric Co.
Watlow Elec. Mfg. Co.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Westinghouse Electric Corp., Sturtevant Div.

SPACE

American Air Filter Co., Inc.
American Blower Corp.
Carrier Corp.
Cutler-Hammer Inc.
Dravo Corp.
General Electric Co., Apparatus Sales Div.
General Electric Co., International
GRAYBAR ELECTRIC CO., INC.
Iron Fireman Mfg. Co.
Mosebach Elec. & Supply Co.
Saracco Tank & Welding Co.
Silent Glow Oil Burner Corp.
U. S. Rubber Co.
Watlow Electric Mfg. Co.
Westinghouse Electric Corp., Sturtevant Div.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

HOISTING CABLE

See Rope, Wire

HOIST COMMUNICATIONS

See Communications

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

HOIST CONTROLS and SAFETY EQUIPMENT

Bullard Co., E. D.
LILLY—SEE LOGAN ENGR. CO.
LOGAN ENGR. CO.
SIMPLEX—SEE LOGAN ENGR. CO.

HOISTING EQUIPMENT

See also Chain Hoists; Rope, Wire

Automatic Skip Loading Devices

Connellsville Mfg. & Mine Supply Co.
Hirsch Bros. Mfg. Co.
LINK-BELT CO.
Ogden Iron Works Co.

Friction Hoists

ASEA—SEE AROS ELECTRIC, INC.
American Hoist & Derrick Co., Crosby-Laughlin Div.
AROS ELECTRIC, INC., ASEA
Connellsville Mfg. & Mine Supply Co.
MAYO TUNNEL & MINE EQUIPMENT

MINE SHAFT HOISTS

Drum

Bodinson Mfg. Co.
Clyde Iron Wks., Inc.
Coeur d'Alene Hardware & Foundry Co.
Connellsville Mfg. & Supply Co.
Electric Controller & Mfg. Co.
Fraser & Chalmers Eng. Wks.
GARDNER-DENVER CO.
General Electric Co. Ltd., The
Gregg Co., Ltd.
Hirsch Bros., Machinery Co.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
LAKE SHORE, INC.
NORDBERG MFG. CO.
Ohio Hoist & Mfg. Co.
Rogers Iron Works Co.
Shepard Niles Crane & Hoist Corp.
STEARNS ROGER MFG. CO.
Superior-Lidgerwood-Mundy Corp.
TELLURIDE IRON WKS.
VULCAN-DENVER—SEE VULCAN IRON WORKS
VULCAN IRON WORKS
Washington Iron Wks.
Western Gear Wks.

SCRAPER HOISTS (slushers)

Portable

American Chain & Cable Co., Inc., Wright Hoist Div.
American Hoist & Derrick Co., Crosby-Laughlin Div.
ATLAS COPCO PACIFIC, INC.
Atlas Copco A. B., Sweden
Brownie—see Sanford Day Iron Works, Inc.
Clyde Iron Wks.
GARDNER-DENVER CO.
GRIPHOIST, INC.
HARNISCHFEGER CORP.
Holman Bros. (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
LEDEEN MFG. CO.
Lug-All Co., The
National Supply Co. (Pa.)
Ohio Hoist & Mfg. Co.
Princeton Griphoist, Inc.
Round Chain Co's.
Sanford Day Iron Wks.
Shepard Niles Crane & Hoist Corp.
Uhrden, Inc.
VULCAN-DENVER—VULCAN IRON WORKS, DENVER, COLO.
Vulcan Iron Works (Pa.)

Stationary

American Chain & Cable Co., Inc. Wright Hoist Div.
Atlas Copco, A. B. Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
Beebe Bros.
Clyde Iron Wks., Inc.
Gregg Co., Ltd.
HARNISCHFEGER CORP.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
LAKE SHORE INC.
NATIONAL IRON CO.
National Supply Co. (Pa.)
Ohio Hoist & Mfg. Co.
Round Chain Co's.
Sanford Day Iron Wks.
SAUERMAN BROS., INC.
Shepard Niles Crane & Hoist Corp.
STEARNS-ROGER MFG. CO.
Uhrden, Inc.
VULCAN-DENVER—SEE VULCAN IRON WORKS, DENVER, COLO.
VULCAN IRON WORKS (DENVER)

SKIPS AND CAGES

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE
Bodinson Mfg. Co.
CARD IRON WORKS CO., THE C. S.
Clyde Iron Works, Inc.
Connellsville Mfg. & Mine Supply Co.
Easton Car & Construction Co.
Gregg Co., Ltd.
Hirsch Bros. Machinery Co.
JETO-SKIP—SEE LAKE SHORE, INC.
LAKE SHORE, INC.
MAYO TUNNEL & MINE EQUIP.
Miners Foundry & Mfg. Co.
NATIONAL IRON CO.
Nolan Co., The
NORDBERG MFG. CO.
Ogden Iron Works Co.
Ohio Hoist & Mfg. Co.
Rogers Iron Works Co.
Sanford-Day Iron Works Inc.
STEARNS ROGER MFG. CO.
TELLURIDE IRON WORKS CO.
VULCAN-DENVER—SEE VULCAN IRON WORKS, DENVER, COLORADO
VULCAN IRON WORKS (COLO.)
Vulcan Iron Works (Pa.)

HOSE

Air Reduction Sales Co.
American Rubber Mfg. Co.
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
Bear—see American Rubber Mfg. Co.
Boston Woven Hose & Rubber Co.
Buck & Associates, Carl
Carlyle Rubber Co., Inc.
Carmac—see Carl Buck & Associates
Champ—see Hose Accessories Co., Champ Industries Div.
Condor—see Raybestos-Manhattan, Inc.
Clearstream-Garden—see Yardley Plastics Co.
Crackerjack—see American Rubber Mfg. Co.
Drullard Co., Howard
EIMCO CORP., THE
Gates Rubber Co., The
Goodall Rubber Co.
Goodrich Co., B. F., Industrial Prod. Div.
Goodyear Tire & Rubber Co.
HEWITT-ROBINS, INC.
Hose Accessories Co., Champ Industries Div.
Industrial Air Prod. Co.
Lee Rubber & Tire Corp., Republic Rubber Div.
Porter Co., H. K., Quaker Rubber Div.
Quaker Pioneer Rubber Mills
Raybestos—Manhattan, Inc.
Tamping Bag Co., Div., Pickard Industries, Inc.
Thermoid Co.
Thor Power Tool Co.
United States Rubber Co.
U. S. Rubber Inc.
Yardley Plastics Co.
Yosemite—see American Rubber Mfg. Co.

HYDROSEPARATORS

See Thickeners and Tanks; Classifiers

IDLERS

See Conveyor Equipment

INCREASERS, SPEED

See Speed Changers

INSTRUMENTS

See Engineering Supplies; Surveying Instruments; Testing and Control Equipment

ION EXCHANGE RESINS

See Reagents and Chemicals

JIGS

See Concentrating Equipment

JIM CROWS

See Track and Accessories

JUMBOS

See Drills, Rock

KILNS

See Dryers and Kilns; Coolers

LABORATORIES AND ASSAYERS

AGENCE MINIERE & MARITIME S. A.
Arizona Assay Office
ARIZONA TESTING LABORATORIES
Bennetts Chemical Laboratory, Inc.
BLACK & DEASON
BOOTH CO., INC.
Braun-Knecht-Heimann Co.
Central Scientific Co. of Calif.
CHAPMAN AND WOOD
Charlton Laboratories
COLORADO ASSAYING CO., THE
Custom Assay Office
Deason & Nichols
DEGGENDORFER, T. G.
DENVER EQUIPMENT CO.
DICKINSON LABORATORIES, INC.
El Paso Testing Laboratories
Engineers Syndicate, Ltd.
GALIGHER CO., THE
GOODALL BROS.
Hanks, Inc., Abbott A.
HAWLEY & HAWLEY
Junction Bit & Tool Co.
KENNEDY—VAN SAUN MFG. & ENG. CORP.
LEDOUX & CO.
Lerlab Supply Co.
Lerch Bros, Inc.
Mack, Peter
Menlo, Research Lab.
Minerals Engineering Co. (Calif.)
Minerals Engineering Co., (Colo.)
Minerals Laboratory
MOBILE DRILLING, INC.
ORE RESEARCH & LABORATORIES
Osborne Laboratories, Inc. Raymond G.
Research Inc.
Root & Simpson, Inc.
SMITH-EMERY CO.
Snell Inc., Foster D.
STEARNS MAGNETIC, INC.
Stowell & Co., W. H.
Sturtevant Mill Co.
Twining Laboratories, The
Udy, Marvin J.
WOOD ASSAYING CO., HENRY R.

LABORATORY EQUIPMENT AND SUPPLIES

See also Reagents and Chemicals

Laboratory and Testing Machines

AGITAIR—SEE GALIGHER CO., THE
Ainsworth & Sons, Inc., Wm.
Ainsworth Balances—see Ainsworth & Sons, Inc.
Bausch & Lomb Optical Co.
Beckman Instruments, Inc., Scientific Instruments Div.
Bico, Inc.
BOOTH CO., INC.
Braun-Knecht-Heimann Co.
Carpco Mfg., Inc.
Central Scientific Co. of Calif.
Denver Fire Clay Co., The
Denver Fire Clay Co.
Detectron Corp.
DFC—see Denver Fire Clay Co., The
Engineers Syndicate, Ltd.
GALIGHER CO.
General Electric Co., International
General Mach. Co.
HARDINGE CO., INC.
HUMPHREYS INVESTMENT CO.
International Combustion Ltd.
International Eng. Inc.
Kentron—see Torsion Balance Co., The
Kentron—see Torsion alance Co., The
LEDOUX & CO.
Lerlab Supply Co.
MacBeth Inst. Corp.
MASSCO—SEE MINE & SMELTER SUPPLY CO.
Menlo Research Laboratory
MINE & SMELTER SUPPLY CO.
Minerais et Metaux
MORSE BROS. MACHINERY CO.
Philips Electronics, Inc., Instruments Div.
Porter Co., Inc., H. K., The, W-S Fittings Div.
Precision Radiation Inst., Inc.
Rawson Electrical Inst. Co.
RO-TAP—SEE TYLER CO., THE W. S.
Sepor Microsplitter Supply
Staplex Co., The
STEARNS MAGNETIC, INC.
Sturtevant Mill Co.
Thompson Balance Co.
Torsion Balance Co., The
TY-LAB—SEE TYLER CO., THE W. S.
TYLER CO., THE W. S.
Ultra Violet Prod., Inc.
Universal Vibrating Screen Co.
Voland & Sons, Inc.
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.

MISCELLANEOUS LABORATORY SUPPLIES

Allied Chem. & Dye Corp., General Chem. Div.
Alpine Laboratories, Ltd.
Bausch & Lomb Optical Co.
Bico, Inc.
Braun-Knecht-Heimann Co.
Carpco Mfg., Inc.
Central Scientific Co. of Calif.
Combustion Engineering Inc., Raymond Div.
DFC—see Denver Fire Clay Co., The
DENVER EQUIPMENT CO.
Denver Fire Clay
Engineers Syndicate, Ltd.
Fischer & Porter Co.
Hevi Duty Electric Co.
Hoffman Bros. Drilling Co.
Industrial Physics & Electronics Co.
International Combustion, Ltd.
Menlo Research Lab.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Nucleonic Corp. of America
Snyder's Mine & Chemical Lab
Sturtevant Mill Co.
Thompson Balance Co.
Ultra-Violet Products

LACING, BELT

See Fasteners, Belt

LAMPS, MINER

See Safety Equipment

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LIGHT PLANTS

See Electrical Equipment

LIGHTS

See Safety Equipment

LINERS

See Grinding Equipment

LOADERS, FRONT END AND OVERHEAD

See also Tractors and Attachments, Self Loading Transport

CRAWLER

Allis-Chalmers Manufacturing Co., Const. Machy. Div.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
American Tractor Equipment Corp.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
ATLAS COPCO, A.B. SWEDEN
Caterpillar Tractor Co.
Drott Mfg. Co.
EIMCO CORP., THE
GOODMAN MFG. CO.
HARNISCHFEGER CORP.
Hough Co., The, Frank G.
INTERNATIONAL HARVESTER EXPORT CO.
JOY MANUFACTURING CO.
Lodover—see Service Supply Co.
MARION POWER SHOVEL CO.
OLIVER CORP., THE
Payloader—see Hough Co., The Frank G.
Pence & Co., Inc., Earl H.
Sanford Day Iron Wks.
Service Supply Co.
Skid-Shovel—see Drott Mfg. Corp.
Tractomotive Corp.
Tracto-Shovel—See Tractomotive Corp.

RAIL (Mucking Machines)

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Atlas Copco, A. B. Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
EIMCO CORP., THE
LONGYEAR, CO., E. J.

RUBBER TIRED

ADAMS TRAVELOADER — SEE LE TOURNEAU-WESTINGHOUSE CO.
American Tractor Equipment Corp.
HOUGH—SEE INTERNATIONAL HARVESTER EXPORT CO.
Hough Co., Frank G.
INTERNATIONAL HARVESTER EXPORT CO.
LE TOURNEAU-WESTINGHOUSE CO.
Mixermobile Mfg. Inc.
Napco Industries, Inc.
OLIVER CORP., THE
Payloader—see Hough Co., The Frank G.
Pettibone Mulliken Corp.
Quaker Pioneer Rubber Mills
Speedall—see Pettibone Mulliken Corp.
Tracto-Loader—see Tractomotive Corp.
Tractomotive Corp.
Westinghouse Air Brake Co.

LOCOMOTIVES

BATTERY

ATLAS CAR & MFG. CO., THE
BALDWIN-LIMA-HAMILTON CORP.
General Electric Co., Apparatus Sales Co.
General Electric Co., International
GOODMAN MFG. CO.
GREENSBURG MACHINE CO.
International General Electric Co.
JEFFREY MANUFACTURING CO.
MANCHA STORAGE BATTERY LOCOMOTIVE DIV., GOODMAN MFG. CO.
THUNES MEK. VERKSTED, A. S.
Vulcan Iron Works (Pa.)
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

COMPRESSED AIR

EIMCO CORP., THE
Hack Eng. Co.
MAYO TUNNEL & MINE EQUIP.
Tramaire—see Hack Eng. Co.
Universal Dredge Mfg. Co.
Universal Tramaire—see Universal Dredge Mfg.

DIESEL

American Locomotive Co.
Fate-Root-Heath Co., The
General Electric Co.
GENERAL MOTORS OVERSEAS OPERATIONS
GREENSBURG MACH. CO.
Gregg Co., Ltd., The
Hack Eng. Co.
International General Electric Co.
Klockner-Humboldt-Deutz, A. G.
LE TOURNEAU-WESTINGHOUSE CO.
MANCHA STORAGE BATTERY LOCOMOTIVE DIV. GOODMAN MFG. CO.
MAYO TUNNEL & MINE EQUIP.
Miller Machinery Co.
Mineral Engineering Co. (Colo.)
Missoula—see Miller Mach. Co.
National Mine Service Co.
PLYMOUTH LOCOMOTIVE WORKS
Ruth Co., The
SWITCHMOBILE—SEE LE TOURNEAU-WESTINGHOUSE CO.
TELLURIDE IRON WORKS CO.
THUNES MEK. VERKSTED, A. S.
Universal Dredge Mfg. Co.
Universal—see Hack Eng. Co.
U.S. Industries, Inc.
Vulcan Iron Works (Pa.)
Westinghouse Electric Corp.

DIESEL-ELECTRIC

Alco Products, Inc.
American Locomotive Co.
Atlas Car & Mfg. Co., The
Baldwin-Lima-Hamilton Corp., Eddystone Div.
DIFFERENTIAL STEEL CAR CO.
Fate-Root-Heath Co., The
General Electric Co., Apparatus Sales Div.
General Electric Co., International
General Motors Corp., Electro-Motive Div.
GENERAL MOTORS OVERSEAS OPERATIONS
GREENSBURG MACHINE CO.
International General Electric Co.
Plymouth—see Fate-Root-Heath Co., The
PLYMOUTH LOCOMOTIVE WORKS
U.S. Industries, Inc.
Vulcan Iron Works (Pa.)

TROLLEY

Atlas Car & Mfg. Co., The
DIFFERENTIAL STEEL CAR CO.
General Electric Co., Apparatus Sales Div.
General Electric Co., International
GOODMAN MFG. CO.
International General Electric Co.
JEFFREY MANUFACTURING CO.
National Mine Service Co.
THUNES MEK. VERKSTED, A. S.
Vulcan Iron Works (Pa.)
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

LOG WASHERS

See Washers

LUBRICANTS

Alemite—see Stewart Warner Corp.
Amalie—see Sonneborn Sons, Inc., L
AP5—see Jet-Lube Inc.
CR—see Jet-Lube Inc.
CALOL—SEE STANDARD OIL CO. OF CALIF.
Climax Molybdenum Co.
Drucolene—see Drullard Co., Howard
Drullard Co., Howard
Esso Standard Oil Co.
Fiske Bros. Refining Co., Lubriplate Div.
Fluidwick Co.
General Petroleum Corp.
Gulf Oil Corp., Gulf Refining Co.
Hi-Lo—see Sahara Oil Co.
Houghton & Co., E. F.
Imperial Oil & Grease Co.
Jet-Lube Inc.
Keystone Lubricating Co.
Kopr-Kote—see Jet-Lube Inc.
Lead-Cote—see Drullard Co., Howard
Lion Brand—see Monsanto Chemical Co.
Lubriplate—see Fiske Bros. Refining Co., Lubriplate Div.
Macmillan Petroleum Corp.
Molub-Alloy—see Imperial & Grease Co.
Monsanto Chemical Co.
Morocco—see Sahara Oil Co.
OG—see Jet-Lube Inc.
Perma-Film—see Jet-Lube Inc.
Permawick—see Fluidwick Co.
Resistolube—see Sahara Oil Co.
Roder-Blackburn Intl. Corp.
RPM—SEE STANDARD OIL CO. OF CALIF.
Sahara Oil Co.
Shell Oil Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co.
Sonneborn Sons, Inc., L.
Sta-put—see Houghton & Co., E. F.
Standard Oil Company (Indiana)
STANDARD OIL CO. OF CALIFORNIA
Stewart Warner Corp.
Texas Co.
Thor Power Tool Co.
Tide Water Associated Oil Co.
Tycol—see Tide Water Associated Oil Co.
UNION OIL CO. OF CALIFORNIA
U. S. Graphite Co.
VL—see Jet-Lube Inc.
Wrightlube—see Wright Power Saw and Tool Corp.
Wright Power Saw and Tool Corp.

LUBRICATING SYSTEM

See also Oilers, Air Line

Alemite—see Stewart-Warner Corp.
Dravo Corp.
Farval Corp., The
Farval-Dualine—see Farval Corp., The
Heyl & Patterson, Inc.
Jet Lube, Inc.
Lube-jet—see Trico Fuse Mfg. Co.
Lunkenheimer Co., The
Stewart-Warner Corp.
Trabon Engr. Co.
Trico Fuse Mfg. Co.

MACHINE SHOP EQUIPMENT

See Sharpeners

MAGNETIC EQUIPMENT

HEAD PULLEYS AND SUSPENSION MAGNETS

Dings Magnetic Separator Co.
Eries Mfg. Co.
Homer Mfg. Co., The
Humboldt, Klockner-Humboldt-Deutz, A. G.
Ohio Electric Mfg. Co.
Stearns Magnetic Products Inc.
THUNES MEK. VERKSTED, A.S.

SEPARATORS

Carpo Mfg. Co.
Crucible Steel Co. of America
Dings Magnetic Separator Co.
Engineers Syndicate, Ltd.
Eries Mfg. Co.
Exolon Co., The
General Electric Co., Carboloy Dept.
Homer Mfg Co., The
Humboldt, Klockner-Humboldt-Deutz, A. G.
Klockner-Humboldt-Deutz, A. G.
JEFFREY-STEFFENSEN—SEE JEFFREY MFG. CO., THE
JEFFREY MANUFACTURING CO.
Johnson, Herbert B.
Magnetic Engineering & Mfg. Co.
Memco—see Magnetic Engineering & Mfg. Co.
Sanford Day Iron Works, Inc.
Scott's Concentrators
Stearns Magnetic Products Inc.
THUNES MEK. VERKSTED, A.S.

MILL DESIGN

See Plant Design and Construction

MINE CARS

See Cars, Mine

MINE DOORS

See Doors, Mine

MINE SAFETY EQUIPMENT

See Safety Equipment

MONITORS (HYDRAULIC)

CHIKSAN CO.
Georgia Iron Works Co.
Hydraulic Supply Mfg. Co.
INTELLI-GIANT—SEE CHIKSAN CO.
Yuba Manufacturing Co.

MOTORS

See also Engines; Electrical Equipment

AIR MOTORS

Atlas Copco, A. B. Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
CHICAGO PNEUMATIC TOOL CO.
Coppus Engineering Corp.
EIMCO CORP.
GARDNER-DENVER CO.
GRAYBAR ELECTRIC CO., INC.
Holman Bros. Ltd.
Holman Brothers (Canada) Ltd.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
LEDEEN MFG. CO.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
PISTONAIR—SEE JOY MFG. CO.
TURBINAIR—SEE JOY MFG. CO.
WESTINGHOUSE ELEC. INTL., CO.

GEAR MOTORS

All-Motor—see Falk Corp., The
Allis Co., The Louis
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Christian Engineers, J. D.
Coeur d'Alene Hardware & Foundry Co.
EIMCO CORP., THE
Fairbanks, Morse & Co.
Falk Corp., The
General Dynamics Corp., Electro Dynamic Div.
General Electric Co., Apparatus Sales Div.
GENERAL MOTORS OVERSEAS OPERATIONS
GRAYBAR ELECTRIC CO., INC.
Hillman Co., Inc., C. Kirk
Ideal Electric & Mfg. Co.
Lima Electric Motor Co., The
LINK-BELT CO.
Master Electric Co., The

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MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Motoreducers—see Falk Corp., The
Pacific—see Western Gear Corp.
Pacific Gear & Tool Works, Inc.
Philadelphia Gear Works, Inc.
Reliance Electric & Engineering Co.
Rite-Lo-Speed—see Christian Engineers, J.D.
Sterling Electric Motors, Inc.
Syncrogear—see U.S. Electrical Motors, Inc.
U.S. Electrical Motors, Inc.
Wagner Electric Corp.
Western Gear Corp., (Lynwood)
Western Gear Corp. (S.F.)
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

HYDRAULIC MOTORS

Berry—see Oliver Iron & Steel Corp.
Oliver Iron & Steel Corp.

MUCKING MACHINES

See Loaders; Shaft Sinking Equipment

NOZZLES

See Screens, Grizzlies and Accessories

OILERS, AIR LINE

Atlas Copco, A. B. Sweden
Atlas Copco Eastern, Inc.
Atlas Copco Pacific, Inc.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
Drullard Co., Howard
EIMCO CORP., THE
GARDNER-DENVER CO.
INGERSOLL-RAND CO.
JOY MANUFACTURING CO.
Thor Power Tool Co.
Victor Equipment Co.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.
Wright Power Saw & Tool Corp.

OILS

See Lubricants; Reagents and Chemicals

OPEN GEARING

See also Gears
Falk Corp., The

ORE TESTING

ARIZONA .TESTING .LABORATORIES
Booth Co., Inc., The
Carpco Mfg. Inc.
DENVER EQUIPMENT CO.
DUNHAM, GORDON MFG. & SALES CO.
GALIGHER CO., THE
General Elec. Co., Ltd., The
Johnson, Herbert B.
Humboldt, Klockner-Humboldt-Deutz, A. G.
Klockner-Humboldt-Deutz, A. G.
LEDOUX & CO.
McDowell Co., Inc.
MOBILE DRILLING, INC.
Nucleonic Corp. of America
Osborne Laboratories, Inc., Raymond G.
SOUTHWESTERN ENGINEERING CO
Telluride Iron Works Co.
Traceriab, Inc.
WESTERN MACHY. CO.

OXYGEN BREATHING APPARATUS

See Safety Equipment

PACKING

Boston Woven Hose & Rubber Co.
CENTIPAC — SEE JOHNS-MANVILLE SALES CORP.
CHEMPAK — SEE JOHNS-MANVILLE SALES CORP.
Garlock Packing Co., The
Gatke Corp.
Goodall Rubber Co.
Goodrich Co., B. F., Indus. Prod. Div.
Goodyear Tire & Rubber Co.
Houghton & Co., E. F.
JOHNS-MANVILLE SALES CORP.
KEARSARGE—SEE JOHNS-MANVILLE SALES CORP.
Lee Rubber & Tire Corp., Republic Rubber Div.
MOGUL—SEE JOHNS-MANVILLE SALES CORP.
Porter Co., Inc., H. K., Quaker Rubber Co., Div.
Quaker Pioneer Rubber Mills
Quaker Rubber Co.
Raybestos-Manhattan, Inc.
Rhoads & Sons, J. E.
SEA RINGS—SEE JOHNS-MANVILLE SALES CORP.
SERVICE — SEE JOHNS-MANVILLE SALES CORP.
Thermoid Co.
Trim—see Houghton & Co., E. F.
United States Rubber Co.
U. S. Rubber Intl.
Vix-Syn—see Houghton & Co., E. F.

PELLETIZERS AND NODULIZERS

Dravo Corp.
Heyl & Patterson, Inc.
International Engr., Inc.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Koppers Co., Inc.
McDowell Co., Inc.

PIPE AND FITTINGS

See also Couplings

ASBESTOS

Air Cel—see The Philip Carey Mfg. Co.
Armco Drainage & Metal Products, Inc.
JOHNS-MANVILLE SALES CORP.
Perfecto—see The Philip Carey Mfg. Co.
Philip Carey Mfg. Co., The
Protecto—see The Philip Carey Mfg. Co.
Superlight—see The Philip Carey Mfg Co.
Tempchek—see The Philip Carey Mfg. Co.
TRANSITE—SEE JOHNS-MANVILLE

CAST AND STEEL

American Locomotive Co.
Armco Drainage & Metal Products, Inc.
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
CW—see National Supply Co., The
Crane Co.
ELECTRIC STEEL FOUNDRY CO.
G—see Grinnell Co., Inc.
Grinnell Co., Inc.
Kaiser Steel Corp.
Lead Lined Iron Pipe Co.
McNally Pittsburg Co.
Michigan Pipe Co.
Mills Iron Wks., Inc.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
National Supply Co., The
Pacific Pipe Co.
Pacific Wood Tank Corp.
Porter Co., Inc., H. K., W-S Fittings Div.
Republic Steel Corp.
Spang—see National Supply Co., The
Taylor Forge & Pipe Works
United States Steel Corp., Columbia Geneva Steel Div.
UNITED STATES STEEL EXPORT CO.
Victaulic Co. of America
Walworth Co.
Western Foundry Co.
Youngstown Sheet & Tube Co., The

COPPER, BRASS AND BRONZE

ANACONDA WIRE AND CABLE CO.
Bridgeport Brass Co.
Chase Brass & Copper Co.
Crane Co.
G—see Grinnell Co., Inc.
Grinnell Co., Inc.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Pacific Pipe Co.
Phelps Dodge Copper Prod. Corp.
Revere Copper & Brass Inc.
Walworth Co.

PLASTIC

American Hard Rubber Co.
Carlon Products Corp.
Clearstream—see Yardley Plastics Co
Colonial Plastic Mfg. Co.
Crane Co.
Goodall Rubber Co.
Goodrich Co., B. F., Industrial Prod. Div.
Grinnell Co., Inc.
Michigan Pipe Co.
Minnesota Mining & Mfg. Co., Irvington Varnish & Insulator, a Div.
National Tank & Pipe Co.
Pacific Pipe Co.
Quaker Pioneer Rubber Mills
Republic Steel Corp.
Ryerson & Son, Inc., Joseph T.
Trabon Eng. Co.
United States Rubber Co.
U. S. STEEL CORP., COLUMBIA-GENEVA STEEL DIV.
Walworth Co.
Yardley Plastics Co.
Youngstown Sheet & Tube Co., The

RUBBER LINED

American Hard Rubber Co.
Crane Co.
Goodall Rubber Co.
Goodrich Co., B. F., Industrial Prod. Div.
Michigan Pipe Co.
NAYLOR PIPE CO.
Pacific Pipe Co.
Quaker Pioneer Rubber Mills
Raybestos-Manhattan, Inc.
U. S. Rubber Co.

STEEL, SPIRAL-WELDED

Armco Drainage & Metal Products, Inc.
Armco Steel Corp.
Hydraulic Supply Mfg. Co.
Lead Lined Iron Pipe Co.
NAYLOR PIPE CO.
Pacific Pipe Co.
Taylor Forge & Pipe Wks.

WOOD

FEDERAL PIPE & TANK CO.
Michigan Pipe Co.
National Tank & Pipe Co.
Pacific Pipe Co.
Pacific Wood Tank Corp.
SANTA FE TANK DIV., FLOUR PRODUCTS CO.
Sutphen, Peter O.

VALVES—see VALVES

PLANT DESIGN AND CONSTRUCTION

Allen and Garcia Co.
Barber-Greene Co.
Baukol, Philip J.
BOOTH CO. INC., THE
Braun & Co., C. F., Alhambra, Calif.
Carpco Mfg. Inc.
CHAPMAN AND WOOD
Continental Gin Co.
DENER EQUIPMENT CO.
DORR-OLIVER, INC.
Dravo Corp.
Drullard Co., Howard
Fisher Contracting Co.
EIMCO CORP., THE
Foster Wheeler Corp.
Freyn Design—see Koppers Co., Inc.
GALIGHER CO.
GOULD & CO., GORDON I.
Hack Engineering Co.
HEWITT-ROBINS INC.
Heyl & Patterson, Inc.
Humboldt, Klockner - Humboldt-Deutz, A. G.
KEEGEL, C. P.
Klockner Humboldt-Deutz, A. G.
Koppers Co., Inc.
LINK-BELT CO.
Lintz, Mark
LONGYEAR CO., E. J.
MACE CO., THE
MAYO TUNNEL & MINE EQUIP.
McDowell Co., Inc.
MEISSNER ENGRS., INC., JOHN F.
Kennedy-Van Saun Mfg. Eng. Corp.
Minerais et Metaux
Minerals Engineering Co. (Colo.)
NATIONAL IRON CO.
Osborne Laboratories Inc., Raymond G.
Osmose Wood Preserving Co. of America, Inc.
Pioneer Eng. Div., Poor & Co., Inc.
Roberts & Schaefer Co.
Rotolite Corp.
Smith Engineering Works
Snell Inc., Foster D.
SOUTHWESTERN ENGINEERING CO.
STEARNS ROGER MFG. CO.
STILL & STILL
TELLURIDE IRON WORKS CO.
Timber Engineering Co.
Treadwell Co., Inc., N. H.
U. S. Steel Corp., American Bridge Div.
Walvoord, Inc., O.W.
Western Knapp Engineering Co.
WESTERN MACH. CO.
Wilmot Eng. Co.
World Mining Consultants, Inc.

PNEUMATIC CONCRETING PLACING

Air Placement Equip. Co.
Bondactor—see Air Placement Equip. Co.
CEMENT GUN CO.
Construction Machinery Co.
Drullard Co., Howard
EIMCO CORP., THE
Grout-or-Blast—see Air Placement Equip. Co.
GUNITE—SEE CEMENT GUN CO.
MAYO TUNNEL & MINE EQUIPMENT
Mix-elvator—see Air Placement Equip. Co.
Nucretor—see Air Placement Equip. Co.

PNEUMATIC TOOLS

See Tools, Air Driven

POSTS

See Arms and Posts

POWDER

See Blasting Supplies

PRESERVATIVES

See Reagents and Chemicals

PROSPECTING EQUIPMENT

See Exploration Equipment

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

PULLEYS

See also Magnetic Equipment

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
Bonded Scale & Machine Co.
Chain Belt Co.
Christian Engineers, J.D.
Continental Gin Co.,
Dings Magnetic Separator Co.
Dodge Mfg. Co.
HEWITT-ROBINS, INC.
Humboldt, Klockner - Humboldt-Deutz, A. G.
Internaldrne—see Yuba Mfg. Co.
JEFFREY MANUFACTURING CO.
LINK-BELT CO.
Lippmann Engineering Works
Magnetic Eng. & Mfg. Co.
Ogden Iron Works Co.
Reeves Pulley Co.
Sanford-Day-Iron Works Inc.
STEPHENS-ADAMSON MFG. CO.
TELLURIDE IRON WORKS CO.
Wedg-Gripp see Christian Engineers, J.D.
Western Foundry Co.
Western Gear Works
Worthington Corp.
Yuba Manufacturing Co.

PULVERIZERS

See Crushers, Grinding Equipment, Laboratory Supplies

PUMPS

ACID

ALLEN-SHERMAN-HOFF PUMP CO., THE
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
American Hard Rubber Co.
AMPCO Metal, Inc.
Ampco Centrifugal Pumps — see Ampco Metal, Inc.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Apco—see New York Air Brake Co., The, Aurora Pump Div.
Aurora—see New York Air Brake Co., The, Aurora Pump Div.
Barrett, Haentjens & Co.
Buck & Associates, Carl
Byron Jackson Pumps, Inc.
Camac—see Carl Buck & Associates
CENTRISEAL—SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
Deming Co.
DENVER EQUIPMENT CO.
Denver Fire Clay Co.
DORR-OLIVER, INC.
Duriron Co. Inc., The
ELECTRIC STEEL FOUNDRY CO.
Fairbanks, Morse & Co.
Food Machinery & Chemical Corp. Peerless Pump Div.
GALIGHER CO., THE
GALIGHER SUMP PUMP—SEE GALIGHER CO., THE
GARDNER-DENVER CO.
Hazelton—see Barrett, Haentjens & Co.
HYDROSEAL—SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
INGERSOLL-RAND CO.
International Combustion, Ltd.
Jaeger Machine Co., The
Krogh Pump & Equipment Co.
LaBour Co.
Moyno—see Robbins & Myers, Inc.
NAGLE PUMPS, INC.
New York Air Brake Co., The, Aurora Pump Div.
OLIVITE—SEE DORR-OLIVER, INC.
Robbins & Myers, Inc.
VACSEAL—SEE GALIGHER CO., THE
VACSEAL—see International Combustion Ltd.
WESTERN MACH. CO.
WILFLEY & SONS, INC., A. R.
Worthington Corp.

AIR DRIVEN

Barrett, Haentjens & Co.
Byron Jackson Pumps, Inc.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
GARDNER-DENVER CO.
Hazelton—see Barrett, Haentjens & Co.
INGERSOLL-RAND CO.
LEDEEN MFG. CO.
Porter Co., Inc., H. K., W-S Fittings Div.
Schramm, Inc.
Thor Power Tool Co.
Westinghouse Air Brake Co., Le Roi Div.

FILTRATE

Barrett, Haentjens & Co.

MINE AND DEEP WELL

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Aurora—see New York Air Brake Co., The, Aurora Pump Div.
Barrett, Haentjens & Co.
Brownie—see Sanford Day Iron Works, Inc.
Byron Jackson Pumps, Inc.
Chicago Penumatic Tool Co.
Deming Co., The
Fairbanks Morse Co.
FLYGT—STANCO MFG. CO. SALES, INC.
GARDNER-DENVER CO.
Hazelton & Pleuger—see Barrett, Haentjens & Co.
INGERSOLL-RAND CO.
Jacuzzi Bros., Inc.
Johnston Pump Co.
Krogh Pump & Equipment Co.
Marlow Pumps Div., Bell & Gossett Co.
Moyno—see Robbins & Meyers, Inc.
National Supply Co. (Pa.)
New York Air Brake Co., The, Aurora Pump Div.
Peerless Pump Div. Pumps, Inc.
Rice Pump & Mach. Co.
Robbins & Myers, Inc.
Sanford Day Iron Works
STANCO MFG. & SALES. INC.
Standard Elec. Mfg. Co., Inc.
Worthington Corp.

SAND AND SLIME

ALLEN-SHERMAN-HOFF PUMP CO., THE
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Barrett Haenjens & Co.
Bodinson Mfg. Co.
CARPCO MFG. INC.
CENTRISEAL—SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
Consolidated Pneumatic Tool Co., Ltd.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
Erie—see Erie Pump & Engine Works
Erie Pump & Engine Works
Food Machinery & Chemical Corp., Peerless Pump Div.
Fraser & Chalmers Eng. Wks.
GALIGHER CO., THE
GALIGHER SUMP PUMP—SEE GALIGHER CO., THE
General Electric Co. Ltd., The
Georgia Iron Works Co.
Hazelton—see Barrett, Haentjens & Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
HYDROSEAL—SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
International Combustion Ltd.
Jaeger Machine Co., The
Johnston Pump Co.
Kansas City Hay Press Co.
Klockner-Humboldt-Deutz, A. G.
Krogh Pump & Equipment Co.
Lightning Pumps—see Kansas City Hay Press Co.
MORRIS MACHINE WORKS
MORSE BROS. MACHINERY CO.
Moyno—see Robbins & Myers, Inc.
NAGLE PUMPS, INC.
O.D.S.—SEE DORR-OLIVER, INC.
Pettibone—Mulliken Corp.
Rice Pump & Machine Co.
Robbins & Myers, Inc.
SPANG & CO.
Swett Iron Works, A. L.
Taylor—Wharton Iron & Steel Co.
TELLURIDE IRON WORKS CO.
VACSEAL—SEE GALIGHER CO., THE
Vacseal—see International Combustion Ltd.
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.
WILFLEY & SONS INC., A. R.
Worthington Corp.
Yuba Manufacturing Co.

VACUUM

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Anco—see Central Scientific Co. of Calif.
Barrett-Haentjens & Co.
Braun-Knecht-Heimann
Central Scientific Co. of Calif.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
DORR-OLIVER, INC.
GARDNER-DENVER CO.
Hazelton—see Barrett, Haentjens & Co.
INGERSOLL-RAND CO.
International Combustion Co.
Jaeger Machine Co., The
OLIVER—SEE DORR-OLIVER, INC.
Roots-Connersville Blower
Sarco Co.
THUNES MEK. VERKSTED, A. S.
Worthington Corp.

PYRO-METALLURGICAL EQUIPMENT

See also Laboratory Equipment and Supplies; Sintering Machines; Dryers and Kilns

CONVERTERS

Allis-Chalmers Mfg. Co.
General Electric Co., Apparatus Sales Div.
Humboldt, Klockner - Humboldt-Deutz, A. G.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Dentz, A. G.

CUPELLING FURNACES

MACE CO., THE

REVERBERATORY FURNACES

Allis-Chalmers Mfg. Co.
Hevi-Duty Electric Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
Klockner-Humboldt-Dentz, A. G.

ROASTING FURNACES

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
COLORADO IRON WORKS CO.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
DORRCO — SEE DORR-OLIVER, INC.
GOULD & CO., GORDON I.
HARDINGE CO., INC.
Hevi-Duty Electric Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner Humboldt-Deutz, A. G.
MACE CO., THE
MINE & SMELTER SUPPLY CO.
Nichols Engineering & Research Corp.
Nichols Herreschoff—see Nichols Engineering & Research Corp.
PACIFIC FOUNDRY CO., LTD.
Parry—see Silver Eng. Co.
Pollock Co., The William B.
Saraco Tank & Welding Co.
Silver Engineering Co.
SKINNER—SEE COLORADO IRON WORKS CO.
STEARNS-ROGER MFG. CO.
TRAYLOR ENGR. & MFG. CO.
U. S. Smelting Furnace Co.
Westinghouse Electric Corp.

SMELTING FURNACES

ALLIS-CHALMERS MFG., INDUSTRIES GROUP
Elektronkemisk A.S.
Elken—see Elektrokemisk A.S.
HEROULT ELECTRIC FURNACE —SEE U.S. STEEL EXPORT CO.
Hevi-Duty Electric Co.
Humboldt, Klocker - Humboldt-Deutz, A. G.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Dentz, A. G.
LECTROMELT FURNACE CO.
MACE CO., THE
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Pollock Co., The William B.
Saracco Tank & Welding Co.
Soderbert Electrodes—see Elektrokemisk, A.S.
TRAYLOR ENGR. & MFG. CO.
Treadwell Co., Inc., M. H.
Tysland-Hole—see Elektrokemisk A.S.
U. S. Smelting Furnace Co.
UNITED STATES STEEL EXPORT CO.
Westinghouse Electric Co.

RADIO SYSTEMS

See Communications

RAIL, MINE

See Track and Accessories

REAGENTS AND CHEMICALS

See also Laboratory Equipment and Supplies

CYANIDE

Allied Chemical & Dye Corp., General Chemical Div.
AMERICAN CYANAMID COMPANY MINERAL DRESSING DEPT.
Braun-Knecht-Heimann Co.,
Denver Fire Clay Co.
du Pont de Nemours & Co., E. I., Electrochemicals Dept.
Matheson Co., Inc., The
Van Waters & Rogers, Inc.

FLOTATION REAGENTS

Alamacs, Alamines—see General Mills Inc., Chem. Div.
Allied Chem. & Dye Corp., Barrett Div. American Agricultural Chem. Corp.
AMERICAN CYANAMID COMPANY MINERAL DRESSING DEPT.
Armacs—see Armour Chemical Division
Armour Chemical Division
ATLAS POWDER CO.
Braun-Knecht-Heimann Co.
Denver Fire Clay Co.
DOW CHEMICAL CO., THE
General Mills, Inc., Chemical Div.
Du Pont de Nemours & Co., Inc., Chemical Div.
Hercules Powder Co.
Koppers Co., Inc.
Matheson Co., Inc., The
Metso—see Philadelphia Quartz Co.
Mona Industries, Inc.
Monamid, Monamine, Monapon, Monaterre, Monawet—see Mona Industries, Inc.
Monsanto Chem. Co.
Newport Industries Co.
PQ—see Philadelphia Quartz Co.
Pennsylvania Salt Mfg., Co.
Philadelphia Quartz Co.
Pentasol—see Sharples Chemicals Inc.
Petroflote—see Sonnsborn Sons, Inc., L.

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Reilly Tar & Chemical Corp.
Sharples Chemicals Inc.
Sonneborn Sons, Inc., L.
Van Waters & Rogers Inc.

Ion Exchange Resins

Matheson Co., Inc., The
Permutt Co., The
Peterson Filter & Engineering Co.
Rohm & Haas Co.

PRESERVATIVES, TIMBER

Allied Chemical & Dye Corp., Barrett Div.
Berk & Co., Inc., F.W.
DOW CHEMICAL CO., THE
Du Pont de Nemours & Co. Inc., Chemical Div.
General Petroleum Corp.
Gilbreath Chemical Co.
Koppers Co., Inc., Wood Preserving Div.
Lerlab Supply Co.
M-T-M, Osmosalts, Osmoplastic, Pentox,—see Osmose Wood Preserving Co.
Matheson Co., Inc., The
Mersolites-Berk & Co., Inc.
Monsanto Chemical Co.
Osmoplastic & Osmosalts—see Osmose Wood Preserving Co. of America, Inc.
Osmose Wood Preserving Co. of America, Inc.
Philadelphia Quartz Co.
Reilly Tar & Chemical Corp.
20—see Gilbreath Chemical Co.
U—see Gilbreath Chemical Co.
U. S. STEEL EXPORT CO.
Van Waters & Rogers, Inc.
Wolman—see Koppers Co., Inc., Wood Preserving Div.
AMERICAN CYANAMID CO.
DOW CHEMICAL CO.

OTHER ACIDS AND CHEMICALS

Allied Chem. & Dye Corp., Barrett Div.
Allied Chemical & Dye Corp., General Chemical Div.
AMERICAN CYANAMID COMPANY—MINERAL DRESSING DEPT.
American Potash & Chemical Corp.
Apache Powder Co.
Armour Chemical Division
ATLAS POWDER CO.,
Berk & Co., Inc., F.W.
Braun Corp.
Braun-Knecht-Heimann Co.
Central Scientific Co. of Calif.
Denver Fire Clay Co.
DOW CHEMICAL CO., THE
du Pont de Nemours & Co., E. I., Chemicals Dept.
Food Machinery & Chemical Corp., Westvaco Chemical Div.
General Mills, Inc., Chemical Div.
Guartec—see General Mills, Inc.
Hercules Powder Co.
Johnson March Corp.
Lerlab Supply Co.
Matheson Co., Inc.
Menlo Research Lab.
Merck & Co.
Mineree Corp.
Mona Industries, Inc.
Monsanto Chemical Co.
Nucleonic Corp. of America
Pennsylvania Salt Mfg. Co.
Phelps Dodge Refining Corp.
Philadelphia Quartz Co.
Reilly Tar & Chem. Corp.
Sharples Chemicals Inc.
Swift & Co., Technical Prod. Plant
Union Carbide and Carbon Corp.
Van Waters & Rogers, Inc.
West Chester Chem. Co.
Westvaco-Chlor-Alkali Div., Food Mach. & Chem. Corp.

RECORDERS

See Testing, Recording & Control Equip.

REDUCERS, SPEED

See Speed Changers

REFRACTORIES

Air Placement Equip. Co.
Alfrax—see Carborundum Co., The
Alundum—see Norton Co.
American Brake Shoe Co.
Aztex—see Mexico Refractories Co.
Babcock & Wilcox Co.
BLAZECRETE—SEE JOHNS-MANVILLE
Carbofrax—see Carborundum Co., The
Carborundum Co., The, Refractories Div.
Crystolon—see Norton Co.
DFC—see Denver Fire Clay Co., The
Denver Fire Clay Co., The
FIRECRETE—SEE JOHNS-MANVILLE
General Refractories Co.
Harbison-Walker Refractories Co.
Jay Bee—see Mexico Refractories Co.
JOHNS-MANVILLE SALES CORP.
Kaiser Aluminum & Chem. Corp.
Mexico Refractories Co.
Monofrax—see Carborundum Co., The
Mullifrax—see Carborundum Co., The
Narco—see North Am. Refractories Co.
North American Refractories Co.
Norton Co.
Refrax—see Carborundum Co., The
Utah Fire Clay Co.

RESPIRATORS

See Safety Equipment

ROASTING FURNACES

See Dryers and Kilns; Pyrometallurgical Equipment; Sintering Machines

ROCK BOLTS

See Bolts, Rock

ROD MILLS

See Grinding Equipment

RODS

See Grinding Equipment; Welding Equipment

ROLLS, ROLLERS

See Crushers; Conveyors

ROOF BOLTS

See Bolts, Rock

ROPE, WIRE, AND ACCESSORIES

American Chain & Cable Company, Inc.
American Chain & Cable Co., Inc., Hazard Wire Rope Div.
American Chain & Cable Co., Inc., Wire Rope Div.
American Hoist & Derrick Co., Crosby-Laughlin Div.
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
Bodinson Mfg. Co.
British Ropes Ltd.
Bullard Co., E. D.
Bullard-Burnham—see Bullard Co., E. D.
Canada Wire & Cable Co., Ltd., P. S. "R"
Canton Mfg. Co.
Carco—see Pacific Car & Foundry Co.
COLORADO FUEL & IRON CORP.,
Crosby—see American Hoist & Derrick Co.
Edwards Co., E. H.
ELECTRIC STEEL FOUNDRY CO.
Failing Co., Geo. F.,
GRAYBAR ELECTRIC CO., INC.
Goodrich Co., The B. F.
GRIPHOIST, INC.
Jones & Laughlin Steel Corp.
Laughlin Co., The Thomas
Laughlin-Crosby — see American Hoist & Derrick Co.
LE TOURNEAU-WESTINGHOUSE CO.
Leschen Wire Rope—see H. K. Porter Co., Inc.
MacWhyte Co.
Mill & Mine Supply, Inc.
Mosebach Electric & Supply Co.
OKONITE CO., THE
Pacific Car & Foundry Co.
Pacific Wire Rope Co.
H. K. Porter Co., Inc., Leschen Wire Rope Div.
Punch-Lok Co.
RIBLET TRAMWAY CO.
Roder-Blackburn Intl. Corp.
Roebling's Sons Corp., John A.
Round Chain Co.
Ryerson & Son, Inc., Joseph T.
SAUERMAN BROS., INC.
Synflex—see Wall Rope Wks., Inc.
TELLURIDE IRON WKS.
Tiger Brand—see U. S. Steel Exp. Co.
TOURNAROPE—SEE LE TOURNEAU-WESTINGHOUSE CO.
Union Wire Rope Corp.
U. S. STEEL CORP.
U.S.S. Tiger Brand—SEE UNITED STATES STEEL CORP., COLUMBIA-GENEVA STEEL DIV.
U. S. STEEL CORP., TENNESSEE COAL & IRON DIV.
UNITED STATES STEEL CORP., COLUMBIA-GENEVA STEEL DIV.
UNITED STATES STEEL EXPORT CO.
Wall Rope Wks., Inc.
Wireco—see Wire Rope Co. of Am. Inc.
Wire Rope Corp., of America, Inc.
WICKWIRE—SEE COLORADO FUEL & IRON CORP., THE

RUBBER PRODUCTS

See Belts; Hose; Conveyor Equipment; Safety Equipment

SAFETY EQUIPMENT

APPAREL

American Optical Co.
Bausch & Lomb Optical Co.
Bullard Co., E. D.
Gardwell—see Safety Clothing & Equipment Co.
Goodall Rubber Co.
JOHNS-MANVILLE SALES CORP.
Lehigh Safety Shoe Co.
MARTINDALE ELECTRIC CO.
MINE SAFETY APPLIANCES CO.
Parker Safety Equipment Co.
Pulmosan Safety Equip. Corp.
Saf I—see U. S. Safety Service Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Sly Mfg. Co., W. W.
United States Rubber Co.
U. S. Safety Service Co.
Wil-Gard—see Wilson Rubber Co., The
Wilson Rubber Co., The

FIREFIGHTING EQUIPMENT

American-LaFrance Corp.
American Rubber Mfg. Co.
Badger Fire Extinguisher Co.
Blackhawk Mfg. Co.
Bullard Co., E. D.
Four Wheel Drive Auto Co., The
General Detroit Corp.
Goodrich Co., The B. F.
Grinnell Co., Inc.
Kidde & Co. Inc., Walter
Lee Rubber & Tire Corp., Republic Rubber Div.
MINE SAFETY APPLIANCES CO.
Pyrene-C-O-Two
Republic Rubber Div., Lee Rubber & Tire Corp.
Safety Clothing & Equipment Co.
Safety Fire Extinguisher Co.
Safety First Supply Co.
U. S. Safety Service Co.

GENERAL

American Optical Co.
Atomic Engineering Corp.
Bullard Co., E. D.
Chicago Eye Shield Co.
Gardwell—see Safety Clothing & Equip. Co.
Linde Air Products Co.
Lunkenheimer Co., The
MINE SAFETY APPLIANCES CO.
National First Aid Supply Co.
Ohio Brass Co.
Rose Mfg. Co.
Safe-Hi—see Rose Mfg. Co.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Willson Products Div., Ray-O-Vac Co.

LIGHTS

A & A Mfg. Co.
American Optical Co.
Bullard Co., E. D.
EDISON—SEE MINE SAFETY APPLIANCES CO.
Electric Storage Battery Co., The, Exide Ind. Div.
General Electric Co., Lamp Div.
GRAYBAR ELECTRIC CO., INC.
Homelite Corp.
Justrite Mfg. Co.
MARTINDALE ELECTRIC CO.
MINE SAFETY APPLIANCES CO.
Mosebach Electric & Supply Co.
Ray-O-Vac Co.
Revere Electric Mfg. Co.
Safety First Supply Co.
United States Electric Mfg. Corp.
U. S. Safety Service Co.
Westinghouse Electric Corp., Cleveland Div.
Wheat—see National Mine Service Co.
Wolf Safety Lamp Co. of America

RESPIRATORS

American Optical Co.
Bullard Co., Ed.
Chicago Eye Shield Co.
COMFO—SEE MINE SAFETY APPLIANCES CO.
DUSTFOE—SEE MINE SAFETY APPLIANCES CO.
Linde Air Prod. Co.
MARTINDALE ELECTRIC CO.
MINE SAFETY APPLIANCES CO.
Pulmosan Safety Equip. Corp.
Safety Clothing & Equipment Co.
Safety First Supply Co.
Super-Tough—see Willson Prod., Inc.
U. S. Safety Service Co.
Willson Prod. Div., Ray-O-Vac Co.

SELF CONTAINED OXYGEN

Bullard Co., Ed.
CHEMOX—SEE MINE SAFETY APPLIANCES CO.
Industrial Air Products Co.
Linde Air Prod. Co.
MINE SAFETY APPLIANCES CO.
Safety First Supply Co.
U. S. Safety Service Co.

SAMPLERS

AGENCE MINIERE ET MARITIME, S. A.
Carrier Conveyor Corp.
COLORADO IRON WKS. CO.
DENVER EQUIPMENT CO.
Denver Fire Clay Co.
Dickinson Laboratories, Inc.
Ducon Co.
GALIGHER CO., THE
GALIGHER JUNIOR—SEE GALIGHER CO., THE
GEARY-JENNINGS—SEE GALIGHER CO., THE
HARDINGE CO., INC.
Heyl & Patterson, Inc.
International Combustion Ltd.
Jones—see Denver Fire Clay Co., The
Klockner-Humboldt-Deutz, A. G.
LEDOUX & CO.
LONGYEAR CO., E. J.
McNally Pittsburg Co.
MINE & SMELTER SUPPLY CO.
MINE SAFETY APPLIANCES CO.
Minerais et Metaux
MOBILE DRILLING INC.
Penndrill—see Pennsylvania Drilling Co.
Pennsylvania Drilling Co.

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Sepor Microsplitter Supply
SMITH-EMERY CO.
Staplex Co., The
Sturtevant Mill Co.
TELLURIDE IRON WORKS CO.
TRAYLOR ENGR. & MFG. CO.
VEZIN—SEE COLORADO IRON WORKS CO.

SAWS, POWER

See also Tools, Air Driven

CHAIN SAWS

Andreas Stihl Maschinenfabrie
GRAYBAR ELECTRIC CO., INC.
Homelite Div., Textron, Inc.
Mill & Mine Supply, Inc.
PORTO-CUT—SEE VULCAN IRON WORKS, DENVER, COLO.
Titan—see Mill & Mine Supply, Inc.
VULCAN IRON WORKS (DENVER)
Wright Power Saw and Tool Corp.

FRAMING SAWS

DENVER EQUIPMENT CO.
STEARNS ROGER MFG. CO.

POWERED HAND SAWS

Andreas Stihl Maschinenfabrie
CHICAGO PNEUMATIC TOOL CO.
GRAYBAR ELECTRIC CO., INC.
SYNTRON CO.
Thor Power Tool Co.
Vulcan-Denver-Vulcan Iron Works
Wright Power Saw & Tool Corp.

SCALES

AUTOMATIC WEIGHING AND BELT SCALES

Bodinson Mfg. Co.
Conveyor Co., The
Fairbanks, Morse & Co.
Howe Scale Co., The
Industrial Physics & Electronics Co.
Koehring Co., Johnson Co., C. S.
McDowell Co., Inc., The
MERRICK SCALE MFG. CO.
POIDOMETER—SEE SCHAFFER POIDOMETER CO.
Richardson Scale Co.
SCHAFFER POIDOMETER CO.
St. Regis Paper Co.
Toledo Scale Co.
Transportometer—see McDowell Co., Inc., The
WEIGHTOMETER—SEE MERRICK SCALE MFG. CO.

TRUCK AND RAILROAD SCALES

Fairbanks, Morse & Co.
Howe Scale Co., The
Industrial Physics & Electronics Co.
Richardson Scale Co.
Toledo Scale Co.

SCRAPERS

See also Excavators; Tractors and Attachments

Allis-Chalmers Mfg., Co., Const. Machy. Div.
ALLOY STEEL & METALS CO.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
American Tractor Equipment Corp.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONST. MACHY. DIV.
Columbia Steel Casting Co., Inc.
CRESCENT — SEE SAUERMAN BROS., INC.
EIMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO.
EUCLID DIV., GENERAL MOTORS CORP.
GENERAL MOTORS CORP, EUCLID DIV.
GENERAL MOTORS OVERSEAS OPERATIONS
International Combustion Ltd.
International Harvester Co.
JOY MANUFACTURING CO.
Landis Steel Co.
LE TOURNEAU-WESTINGHOUSE CO.
Ogden Iron Works Co.
PACIFIC—SEE ALLOY STEEL & METALS CO.
SLUSH MASTER—
Pacific Car & Foundry Co.
SAUERMAN BROS., INC.
Terra Clipper—see Woolridge Mfg. Co.
VULCAN DENVER—SEE VULCAN IRON WORKS, DENVER, COLO.
VULCAN IRON WORKS (DENVER)
Westinghouse Air Brake Co. (Pa.)
WESTINGHOUSE CO., LE TOURNEAU
Woolbridge Mfg. Div., Continental Copper & Steel Industries, Inc.

SCREENS, GRIZZLIES, AND ACCESSORIES

REVOLVING SCREENS

Bodinson Mfg. Co.
Cleveland Wire Cloth & Mfg. Co., The
Conveyor Co., The
DENVER EQUIPMENT CO.
Iowa Mfg. Co.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
NORDBERG MFG., CO.
Pioneer Eng. Div., Poor & Co., Inc.
Rogers Iron Work Co.
Smith Engineering Works
STEARNS—ROGER MFG. CO.
SYMONS—SEE NORDBERG MFG., CO.
TELLURIDE IRON WORKS CO.
TYLER CO., W. S., THE
Washington Iron Works
Washington Machinery Co.
WEDGE WIRE CORP.

SHAKING AND VIBRATING SCREENS

AERO-VIBE—SEE ALLIS CHALMERS MFG. CO.
ALLIS CHALMERS MFG. CO., INDUSTRIES GROUP
Barber-Greene Co.
Bodinson Mfg. Co.
Braun-Knecht-Heimann Co.
CAL-WIC—SEE COLORADO FUEL & IRON CORP., THE
Carrier Conveyor Corp.
Cleveland Wire Cloth & Mfg. Co., Inc., The
COLORADO FUEL & IRON CORP., THE
Conveyor Co., The
DEISTER CONCENTRATOR CO.
Deister Machine Co.
DENVER EQUIP. CO.
Diamond Iron Works Div., Goodman Mfg. Co.
Exolon Co., The
Fraser & Chalmers, Eng. Wks.
General Electric Co. Ltd., The
Gruendler Crusher & Pulverizer Co.
GYROSET — SEE PRODUCTIVE EQUIPMENT CORP.
Hendrick Mfg. Co.
HEWITT-ROBINS, INC.
Humboldt, Klockner - Humboldt-Deutz, A. G.
HUM-MER—SEE TYLER CO., THE W. S.
International Combustion Ltd.
Iowa Mfg. Co.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Korb Pettit-Wire Fabrics & Iron Wks., Inc.
LEAHY—SEE DEISTER CONCENTRATOR CO.
LINK-BELT CO.
Lippmann Engineering Works
LOW-HEAD—SEE ALLIS CHALMERS MFG. CO.
McLanahan & Stone Corp.
MINE & SMELTER SUPPLY CO., THE MARCY MILL DIV.
Miners Foundry & Mfg. Co.
NORDBERG MFG. CO.
Overstrom & Sons
Pioneer Engineering Div., Poor & Co., Inc.
PRODUCTIVE EQUIPMENT CORP.
RIFL FLO—SEE ALLIS CHALMERS MFG. CO.
ROSS SCREEN & FEEDER CO.
Screen Equipment Co., Inc.
Seco—see Screen Equipment Co., Inc.
Selectro—see Productive Equipment Corp.
Simplicity Engineering Co.
Smith Engineering Works
SOUTHWESTERN ENGR. CO.
STA KLEEN—SEE ALLIS CHALMERS MFG. CO.
STEARNS-ROGER MFG. CO.
STEPHENS-ADAMSON MFG. CO.
Straub Mfg. Co., Inc.
Sturtevant Mill Co.
SYMONS—SEE NORDBERG MFG. CO.
Symons Bros. Co.
SYNTRON CO.
Taylor-Wharton Iron & Steel Co.
THERMO-DECK — SEE ALLIS CHALMERS MFG. CO.
TY-ROCK—SEE TYLER CO., THE W. S.
TY-ROCKET—SEE TYLER CO., THE W. S.
TYLER CO., THE W. S.
TYLER-NIAGARA—SEE TYLER CO., THE W. S.
UNIVERSAL ENGINEERING CORP.
Universal Vibrating Screen Co.
WEDGE WIRE CORP.
Williams Crusher & Pulverizer Co.
Wilmot Engineering Co.
Yuba Manufacturing Co.

STATIONARY SCREENS AND GRIZZLIES

AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bixby-Zimmer Engineering Co.
Bodinson Mfg. Co.
CAL-WIC—SEE COLORADO FUEL & IRON CORP., THE
CARD IRON WKS., CO.
COLORADO FUEL & IRON CORP., THE
Columbia Steel Casting Co. Inc.
Conveyor Co., The
Diamond Iron Works Div., Goodman Mfg. Co.
DORR-OLIVER, INC.
Fraser & Chalmers Eng. Wks.
Gruendler Crusher & Pulverizer Co.
Hendrick Mfg. Co.
HEWITT-ROBINS, INC.
Iowa Mfg. Co.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Lippmann Engineering Works
MALLIX—SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.
NATIONAL IRON CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
Nolan Co., The
Os-A-Veyer—see Simplicity Eng. Co.
Pioneer Eng. Div., Poor & Co., Inc.
ROSS SCREEN & FEEDER CO.
Simplicity Eng. Co.
Smith Engineering Works
STEARNS-ROGER MFG. CO.
Straub Mfg. Co., Inc.
STEPHENS-ADAMSON MFG. CO.
Star Wire Screen & Iron Wks., Inc.
SYNTRON CO.
Taylor-Wharton Iron & Steel Co.
Telluride Iron Wks.
TRAYLOR ENGINEERING & MFG. CO.
TYLER CO., THE W. S.
Washington Machinery Co.
WEDGE WIRE CORP.
Yuba Mfg. Co.

TROMMELS

ALLIS CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bodinson Mfg. Co.
CAL-WIC—SEE COLORADO FUEL & IRON CORP., THE
CARDIRON WKS. CO.
Cleveland Wire Cloth & Mfg. Co.
COLORADO FUEL & IRON CORP., THE
Columbia Steel Casting Co. Inc.
Conveyor Co., The
Gruendler Crusher & Pulverizer Co.
Gundlach Machine Co., T. J.
Hendrick Mfg. Co.
Iowa Mfg. Co.
JEFFREY MANUFACTURING CO.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
LINK-BELT CO.
Lippmann Engineering Works
Macklin Equip. Co.
McLanahan & Stone Corp.
Miners Foundry & Mfg. Co.
NORDBERG MFG. CO.
Pioneer Engineering Div., Poor & Co., Inc.
Rogers Iron Works Co.
Smith Engineering Works
STEARNS ROGER MFG. CO.
STEPHENS-ADAMSON MFG. CO.
Straub Mfg. Co., Inc.
SYMONS—SEE NORDBERG MFG. CO.
Taylor-Wharton Iron & Steel Co.
TELLURIDE IRON WKS.
TRAYLOR ENGR. & MFG. CO.
Universal Engineering Corp.
Washington Iron Wks.
WEDGE WIRE CORP.
Yuba Manufacturing Co.

VERTICAL SCREENS

LINK-BELT CO.
NORDBERG MFG. CO.
SYMONS—SEE NORDBERG MFG. CO.

VIBRATING GRIZZLIES

LINK-BELT CO.
NORDBERG MFG. CO.
SYMONS—SEE NORDBERG MFG. CO.

WIRE AND BAR SCREENS

ALLIS CHALMERS MFG., CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MAGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bixby-Zimmer Engineering Co.
Bodinson Mfg. Co.
CAL-WIC—SEE COLORADO FUEL & IRON CORP., THE
Chain Belt Co.
Cleveland Wire Cloth & Mfg. Co.
COLORADO FUEL & IRON CORP., THE
Conveyor Co., The
Fraser & Chalmers Eng. Wks.
Gyraloy—see Korb Pettit Wire Fabrics
Hendrick Mfg. Co.
HEWITT-ROBINS, INC.
Hewitt-Robins Inc.; Korb-Pettit Wire Fabrics & Iron Works, Inc., a subsid.
Iowa Mfg. Co.
Klockner-Humboldt-Deutz, A. G.
Korb Pettit Wire Fabrics & Iron Wks., Inc.
LINK-BELT CO.
Lippmann Engineering Works
Ludlow-Saylor Wire Cloth Co.
MALLIX—SEE NATIONAL MALLEABLE & STEEL CASTINGS CO.
NATIONAL MALLEABLE & STEEL CASTINGS CO.
NORDBERG MFG. CO.
Overstrom & Sons
Pioneer Eng. Div., Poor & Co., Inc.
PRODUCTIVE EQUIP. CORP.
ROSS SCREEN & FEEDER CO.
Simplicity Engineering Co.
Smith Engineering Works
STARSTEEL—see Star Wire Screen & Iron Works, Inc.
Star Wire Screen & Iron Works, Inc.
Sta—Clear
Sta-Smooth — see Ludlow-Saylor Wire Cloth Co.
Sta-Tru
SEARNS-ROGER MFG. CO.
Super Gyraloy-Korb Pettit Wire Fabrics & Iron Works, Inc.
Super-LOY—see Ludlow-Saylor Wire Cloth Co.
SYMONS—SEE NORDBERG MFG. CO.
Taylor-Wharton Iron & Steel Co.
TY-LOC—SEE TYLOR CO., THE W. S.
TYLOR CO., THE W. S.
Universal Engineering Corp.
Wedge Slot—see Hendrick Mfg. Co.
WEDGE WIRE CORP.

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SPRAY NOZZLES

Carbofrax—see Carborundum Co., The, Refractories Div.
Carborundum Co., The, Refractories Div.
Chain Belt Co.
CONCENSO—SEE DEISTER CONCENTRATOR CO.
DEISTER CONCENTRATOR CO.
Deister Machine Co.
Goodrich Co., The B. F.
Grinnel Co., Inc.
Iowa Mfg. Co.
LINK-BELT CO.
Refrax—see Carborundum Co., The, Refractories Div.
Rex—see Chain Belt Co.
Spraying Systems Co.
Yuba Manufacturing Co.

SCRUBBERS

EXHAUST, DIESEL

Bodinson Mfg. Co.
EIMCO CORP., THE
INTERNATIONAL HARVESTER CO.
Ocm Diesseler Exhaust—see Oxy-Catalyst, Inc.
Oxy-Catalyst, Inc.
Ruth Co., The
TELLURIDE IRON WORKS CO.

GAS

Johnson-March Corp.
Klockner-Humboldt-Deutz, A. G.
OCM Catalytic Exhaust, Oxy Muffler Exhaust, Oxycat—see Oxy-Catalyst, Inc.
Oxy-Catalyst, Inc.
Peterson Filters & Engr. Co.
SANTA FE TANK DIV., FLOUR PRODUCTS CO.
STEARNS-ROGER MFG. CO., THE
Winslow Eng. & Mfg. Co.

SAND

ALLIS CHALMERS MFG. CO., INDUSTRIES GROUP
Bodinson Mfg. Co.
Conveyor Co., The
Gruendler Crusher & Pulverizer Co.
Hack Engineering Co.
HARDINGE CO., INC.
Iowa Mfg. Co.
LINK-BELT CO.
Lippmann Engineering Works
MARCY—SEE MINE & SMELTER SUPPLY CO., THE
McLanahan & Stone Co.
MINE & SMELTER SUPPLY CO., THE
Rogers Iron Works Co.
Smith Engineering Works
Straub Mfg. Co., Inc.
TELLURIDE IRON WKS.
Universal Dredge Mfg. Co.
Washington Machinery Co.
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.

SELF LOADING TRANSPORT, UNDERGROUND

EIMCO CORP., THE
Gismo — see Sanford - Day Iron Works, Inc.
HEWITT-ROBINS, INC.
Irwin Foundry & Mine Car Co.
Napco Industries, Inc.
Sanford Day Iron Wks.
Westinghouse Air Brake Co., (Pa.)
Westinghouse Air Brake Co., Le Roi Div.

SEPARATORS

See also Magnetic Equipment; Classifiers; Concentrators

AIR

American Air Filter Co., Inc.
CE-Raymond—see Combustion Engineering, Inc.
Combustion Engineering, Inc., Raymond Div.
DriAir—see New Jersey Meter Co.
EIMCO CORP., THE
HARDING CO., INC.
I-T-E Circuit Breaker Co.
International Combustion, Ltd.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
Klockner-Humboldt-Deutz, A. G.
New Jersey Meter Co.
Sly, Mfg. Co. W. W. The
Sturtevant Mill Co.
Universal Road Machinery Co.
Williams Crusher & Pulverizer Co.

ELECTROSTATIC

American Air Filter Co., Inc.
Johnson, Consultant, Herbert B.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

SETS, STEEL

See Steel

SHAFT COUPLINGS

See Couplings

SHAFT MOUNTED DRIVES

See also Drives; Gears; Open Gearing

Falk Corp., The
LINK-BELT CO.
Ohio Gear Co., The

SHAFT SINKING

CONTRACTORS

BOYLES BROS. DRILLING CO.
Dravo Corp.
LONGYEAR CO., E. J.
McClintock Co.
McKenzie & Whittle Cont.

EQUIPMENT

Barrett, Haentjens & Co.
CRYDERMAN—SEE SHAFT & DEVELOPMENT MACH. CO.
JOY MFG. CO.
MAYO TUNNEL & MINES EQUIP.
Miners Foundry & Mfg. Co.
Ogden Iron Works Co.
PINAZZA—SEE VULCAN IRON WKS., (COLO.)
SHAFT & DEVELOPMENT MACH.
TELLURIDE IRON WORKS CO.
VULCAN IRON WORKS CO.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.

SHAKERS, CAR

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
HEWITT-ROBINS, INC.
LINK-BELT CO.
R & M—see Robbins & Myers, Inc.
Robbins & Myers, Inc.
Simplicity Engr. Co.
STEPHENS-ADAMSON MFG. CO.

SHARPENERS, ROCK BIT AND STEEL

Atlas Copco A. .B Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
Coeur d'Alene Hardware & Foundry Co.
Dravo Corp.
INGERSOLL-RAND CO.
MASSCO—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
STANCO MFG. & SALES, INC.

SHEAVES

See Blocks and Sheaves

SHOVELS, POWER

See Excavators

SINKERS

See Drills, Rocks

SINTERING MACHINES

See also Pyrometallurgical Equipment

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Aorco—see Koppers Co., Inc.
Dravo Corp.
Dwight Lloyd—see McDowell Co., Ltd.
ELECTRIC STEEL FOUNDRY CO.
Hevi-Duty Electric Co.
Heyl & Patterson, Inc.
KENNEDY-VAN SAUN MFG. & ENG. CORP.
MACE CO., THE
McDowell Co., Inc., The
NATIONAL MALLEABLE & STEEL CASTINGS CO.
Pollock Co., The William B.
SMIDTH & CO., F. L.
Yuba Manufacturing Co.

SKIPS

See Hoisting Equipment

SLACKLINES

See Excavators

SLINGS

See Rope, Wire

SLUSHERS

See Excavators; Hoisting Equipment; Scrapers

SMELTING & REFINING EQUIPMENT

See Pyrometallurgical Equipment

SOLVENTS URANIUM

see Reagents and Chemicals

SPEED CHANGERS, INCREASERS AND/OR REDUCERS

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Ampli-Speed—see Electric Machy. Mfg. Co.
Bodinson Mfg. Co.
BROWN INC., DAVID
Christian Engineers, J. D.
Cleveland Worm & Gear Co., The
Conveyor Co., The
Dodge Manufacturing Corp.
Electric Machinery Mfg. Co.
Falk Corp., The
Farrel-Birmingham Co., Inc.
General Dynamic Corp., Electro Dynamic Div.
General Electric Co., Apparatus Sales Div.
General Electric Co., International
HEWITT-ROBINS, INC.
IN-LINE HELICAL—SEE LINK-BELT CO.
Lima Electric Motor Co.
LINK-BELT CO.
Master Electric Co., The
Metron Instrument Co.
Morse Chain Co.
NATIONAL IRON CO.
National Supply Co., (Pa.)
Ohio Gear Co.
Oilgear Co., The
PARALLEL SHAFT GEAR—SEE LINK-BELT CO.
Philadelphia Gear Works, Inc.
P.I.V.—SEE LINK-BELT CO.
RADICON—SEE BROWN INC., DAVID
Reeves—see Reliance Electric & Engr. Co.
Reliance Electric & Engr. Co.
Rite-Lo-Speed—see Christian Engineers, J.D.
SACO—SEE STEPHENS-ADAMSON MFG., CO.
Schoonmaker Co. Inc., P. G.
Shepard Niles Crane & Hoist Corp.
STEARNS-ROGER MFG. CO.
Speedaire—see Cleveland Worm & Gear., The
STEPHENS-ADAMSON MFG. CO.
Sterling Electric Motors, Inc.
Syncrogear—see U.S. Electrical Motors, Inc.
TELLURIDE IRON WORKS
Torque-Arm—see Dodge Mfg. Co.
U.S. Electrical Motors, Inc.
Universal Gear Works, Inc.
Varidrive—see U. S. Electrical Motors, Inc.
VARI PITCH—SEE ALLIS-CHALMERS MFG. CO.
Western Gear Corp. (Lynwood)
Western Gear Corp. (Wash.)
Western Gear Corp., Pacific Gear
Westinghouse Elec. Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Worthington Corp.
Yuba Manufacturing Co.

SPIRALS

See Concentrators

SPOTTERS, CAR

Advance Car Mover Co., Inc.
Aldon Company, The
Appleton—see Advance Car Mover Corp.
Badger Line—see Advance Car Mover Co., Inc.
Bodinson Mfg. Co.
Brownie—see Sanford Day Iron Wks.
Christian Engineers, J.D.
Connellsville Mfg. & Mine Supply Co.
Gregg Co., Ltd.
HEWITT-ROBINS, INC.
Hough Co., The Frank G.
JEFFREY MANUFACTURING CO., THE
JOY MANUFACTURING CO.
LINK-BELT CO.
Nolan Co., The
Nolan Porta-Feeder—see Nolan Co., The
Sanford Day Iron Wks.
STEPHENS-ADAMSON MFG. CO.
Superior-Lidgerwood-Mundy Corp.
Vulcan Iron Works (Pa.)

STEEL

See also Bits, Sets

ALLOY STEEL

ALLISON STEEL MFG. CO.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Armco Steel Corp.
Atlas Copco Pacific, Inc.
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Co.
Crucible Steel Co. of America
ELECTRIC STEEL FOUNDRY CO.
Firth Sterling Inc.
Junction Bit & Tool Co.
Kaiser Steel Corp.
Manganal—see Stulz-Sickles Co.
Republic Steel Corp.
Ryerson & Son, Inc., Joseph T.

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SANDVIK COROMAT—SEE ATLAS COPCO, A.B. SWEDEN
SHEFFIELD STEEL DIV., ARMCO STEEL CORP.
SHEFFIELD STEEL CORP.
Sterling—see Firth Sterling, Inc.
Stulz-Sickles Co.
Taylor-Wharton Iron & Steel Co.
TIMKEN ROLLER BEARING CO., THE
Uddia-Uddeholm Co. of America
UNITED STATES STEEL EXPORT CO.
USS—SEE U.S. STEEL CORP.
U.S. STEEL CORP.
COLUMBIA-GENEVA STEEL DIV.

DRILL STEEL

ALLISON STEEL MFG. CO.
AMERICAN BRAKE SHOE CO.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
ATLAS COPCO, A.B. SWEDEN
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
BRUNNER & LAY INC.
Crucible Steel Co. of America
Drullard Co., Howard
Firth Sterling, Inc.
GARDNER-DENVER CO.
INGERSOLL-RAND CO.
Pennsylvania Drilling Co.
Porto Tool Co.
Republic Steel Corp.
Ryerson & Son, Inc., Joseph T.
SHEFFIELD STEEL DIV., ARMCO STEEL CORP.
Thor Powder Tool Co.
Uddia Uddeholm Co. of America
U. S. STEEL EXPORT CO.
VAREL MFG. CO.
Westinghouse Air Brake Co., Le Roi Div.

SETS—CIRCULAR STEEL

ALLISON STEEL MFG. CO.
BETHLEHEM PACIFIC COAST STEEL CORP.
Chapman-Dyer Steel Co.
COLORADO FUEL & IRON CORP., THE
Commercial Shearing & Stamping Co.

Yieldable Steel

Bethlehem Steel Corp.
Bethlehem Steel Export Corp.

STRUCTURAL STEEL

ALLISON MFG. CO.
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
Bodinson Mfg. Co.
C F & I—SEE COLORADO FUEL & IRON CORP., THE
COLORADO FUEL & IRON CORP., THE
Commercial Shearing & Stamping Co.
Kaiser Steel Corp.
Ogden Iron Works Co.
Pacific Car & Foundry Co.
Ryerson & Son, Inc., Joseph T.
SHEFFIELD STEEL DIV., ARMCO STEEL CORP.
TENNESSEE COAL & IRON DIV., U. S. STEEL CORP.
U. S. STEEL CORP. AMERICAN BRIDGE DIV.
UNITED STATES STEEL CORP., COLUMBIA-GENEVA STEEL DIV.
UNITED STATES STEEL EXPORT CO.
USS—SEE UNITED STATES STEEL CORP., COLUMBIA-GENEVA STEEL DIV.
Yuba Mfg. Co.

STOPERS

See Drills, Rock

SURVEYING INSTRUMENTS & EQUIPMENT

See also Engineering and Drafting Equipment; Exploration Equipment

Ainsworth & Sons, Inc., Wm.
Bausch & Lomb Optical Co.
Berger & Sons, Inc., C.L.
Brunton Transit—see Wm. Ainsworth & Sons, Inc.
Geo-Optic Co. Inc.
Gurley, W. & L.E.
Kern Instruments, Inc.
Keuffel & Esser Co.
Laisco—Los Angeles Scientific Instrument Co.
LONGYEAR CO., E. J.
Lufkin Rule Co.
Menlo Research Lab.
Precision Radiation Instruments, Inc.
Radiac Co., Inc., The
Rocky Mountain Instrument Co.
Rotolite Corp.
Universal Atomics
White Co., David
WILD HEERBRUGG INSTRUMENTS, INC.

SWITCHES, RAIL

See Track and Accessories

TABLES

See Concentrators

TANKS

See Thickeners and Tanks; Agitators and Conditioners

TELEPHONES

See Communications

TELEVISION, INDUSTRIAL

Philips Electronics, Inc., Instruments Div.

TESTING

See Laboratories

TESTING, RECORDING & CONTROL EQUIPMENT

See also Gauges; Scales; Television, Industrial

MILL CONTROL

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Analytical Measurements, Inc.
Beckman Instruments, Inc., Scientific Instruments Div.
Bristol Co., The
Cutler-Hammer, Inc.
Fischer & Porter Co.
General Electric Co., Apparatus Sales Div.
Industrial Physics & Electronics Co.
LINK-BELT CO.
MASSCO-ADAMS—SEE MINE & SMELTER SUPPLY CO.
MINE & SMELTER SUPPLY CO.
Norwood Controls Unit
Philadelphia Gear Works, Inc.
Reliance Electric & Engineering Co.

PYROMETALLURGICAL CONTROL

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
Barber-Colman Co.
Bristol Co., The
Foxboro Co., The
General Electric Co., Apparatus Sales Div.
Industrial Physics & Electronics Co.
Leeds & Northrop Co.
Minneapolis-Honeywell Regulator Co.
Pyro—see Pyrometer Instrument Co., Inc.
Pyrometer Instrument Co., Inc.
Robertshaw-Fulton Controls Co.
Weston Electrical Instrument Corp.
Wheel Co., Instruments Div.

RECORDERS

Barber-Colman Co.
Bristol Co., The
Douglas & Gierans
Electronix—see Minneapolis-Honeywell Regulator Co.
Esterline Angus Co., Inc.
Fischer & Porter Co.
Foxboro Co., The
General Electric Co., Apparatus Sales Div.
Industrial Physics & Electronics Co.
Leeds & Northrop Co.
LOGAN ENGR. CO.
Minneapolis-Honeywell-Heiland Div.
Minneapolis-Honeywell Regulator Co.
Penn Instrument Corp.
Permutit Co., The
Pyrometer Instrument Co., Inc.
Richardson Scale Co.
Robertshaw-Fulton Controls Co.
Seismograph Service Corp.
Texas Instruments, Inc. (Dallas)
Wheelco., Instruments Div., Barber-Colman Co.

THICKENERS AND TANKS

See also Cyclones

STEEL TANKS

ALLISON STEEL MFG. CO.
Bethlehem Steel Co.
BETHLEHEM STEEL EXPORT CORP.
Black, Sivalls & Bryson, Inc.
Butler Mfg. Co.
COLUMBIAN STEEL TANK CO.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
Enterprise Eng. & Mach. Co.
General American Transportation Corp.
Gregg Co., Ltd., The
Hirsch Bros. Machinery Co.
Hydraulic Supply Mfg. Co.
Kaiser Steel Corp.
Klockner-Humboldt-Deutz, A. G.
Michigan Pipe Co.
Miners Foundry & Mfg. Co.
Ogden Iron Works Co.
Pollock Co., The Wm. B.
Sanford-Day Iron Works Inc.
Sarracco Tank & Welding Co.
STEARNS-ROGER MFG. CO.
Washington Mach. Co.
Wilmot Engineering Co.

THICKENERS

Butler Mfg. Co.
COLUMBIAN STEEL TANK CO.
DENVER EQUIPMENT CO.
DORR-OLIVER, INC.
EIMCO CORP., THE
HARDINGE CO., INC.
Hirsch Bros. Machy. Co.
International Combustion Ltd.
Klockner-Humboldt-Deutz, A. G.
LINK-BELT CO.
Miners Foundry & Mfg. Co.
MORSE BROS. MACHINERY CO.
Ogden Iron Works Co.
Sarracco Tank & Welding Co.
STEARNS-ROGER MFG. CO.
WEMCO—SEE WESTERN MACHINERY CO.
WESTERN MACHINERY CO.,

WOOD TANKS

BAGAC—SEE MAHOGANY IMPORTING CO.
Black, Sivalls & Bryson, Inc.
DENVER EQUIP. CO.
FEDERAL PIPE & TANK CO.,
MAHOGANY IMPORTING CO.
Michigan Pipe Co.
MORSE BROS. MACHINE CO.
NATIONAL TANK & PIPE CO.
Pacific Wood Tank Corp.
SANTA FE TANK DIV., FLUOR CORP.
WINDELER CO., LTD., GEORGE

TIES, TRACK

See Track and Accessories

TIMBER

CONNECTORS & TOOLS

Timber Engineering Co.

MINE

Koppers Co., Inc.
Osmose Wood Preserving Co. of America, Inc.

SHAFT GUIDES

BAGAC—SEE MAHOGANY IMPORTING CO.
MAHOGANY IMPORTING CO.

TIRES AND TUBES, OFF-HIGHWAY

Firestone Tire & Rubber Co., The
Gates Rubber Co.
Goodrich Co., The B. F.
Goodyear Tire & Rubber Co.
U. S. Royal—see U. S. Rubber
United States Rubber Intl.

TOOLS, AIR DRIVEN-PORTABLE

See also Drills, Rock

Atlas Copco, AB Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
CHICAGO PNEUMATIC TOOL CO.
Consolidated Pneumatic Tool Co., Ltd.
GARDNER-DENVER CO.
Holman Bros. (Canada) Ltd.
INGERSOLL RAND CO.
JOY MFG. CO.
Le Roi Div. Westinghouse Air Brake Co.
Lorantco—see Newage Intl., Inc.
National Supply Co., (Pa.)
Porter, Inc., H. K.
Thor Power Tool Co.
VULCAN IRON WORKS CO.
Westinghouse Air Brake Co., Le Roi Div.
Worthington Corp.
Wright Power Saw & Tool Corp.

TOOLS, INDUSTRIAL GUN

Remington Arms Co., Inc.,
Remington Industrial Gun—see Remington Arms Co.

TORQUE CONVERTERS

See Transmissions

TRACK & ACCESSORIES

RAIL AND TIES, STEEL

Aldon Co., The
ALLISON STEEL MFG. CO.,
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.

Manufacturer's Complete Names and Addresses are listed in Section II, last pages of this yellow section. Firms appearing in boldface caps carry advertisements in this issue.

C P & I—SEE COLORADO FUEL & IRON CORP., THE
Central Frog & Switch Co., The
COLORADO FUEL & IRON CORP., Gregg Co., Ltd., The
Koppers Co., Inc.
Mosebach Electric & Supply Co.
Reilly Tar & Chem. Co.
Ryerson & Son, Inc., Joseph T.
U.S. Industries, Inc.
UNITED STATES STEEL CORP., COLUMBIA-GENEVA STEEL DIV.
U. S. STEEL CORP., TENNESSEE COAL & IRON DIV.
USS—SEE U. S. STEEL CORP.

SWITCHES, FROGS, CROSSINGS, ETC.

Aldon Company, The
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE CO.
Atlas Car & Mfg. Co., The
BETHLEHEM PACIFIC COAST STEEL CORP.
Bethlehem Steel Co.
Bethlehem Steel Export Corp.
CARD IRON WORKS CO., THE, C. S.
Central Frog & Switch Co., The
Gregg Co., Ltd. The
Hockensmith Corp., The
Jim Crow—see the Aldon Company
Mosebach Electric & Supply Co.
Nolan Co., The
Pettibone-Mulliken Corp.
Samson—see the Aldon Co.
Taylor-Wharton Iron & Steel Co.
U.S. Industries, Inc.
USS—SEE U. S. STEEL CORP.
U. S. STEEL CORP. COLUMBIA-GENEVA STEEL DIV.
Weir Kilby Corp.

TRACTORS & ATTACHMENTS

See Engine Exhaust Conditioners, Underground

FORK LIFT TRUCKS

Hyster Co.

TRACTORS

Agricat—see Pence & Co., Inc., Earl H.
Allis Chalmers Mfg. Co., Buda Div.
Allis-Chalmers Manufacturing Co., Construction Machy. Div.
American Tractor Equipment Corp.
Autocar—see The White Motor Co., Autocar Div.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONSTRUCTION MACHY. DIV.
Drott Mfg. Corp.
EIMCO CORP. THE
GENERAL MOTORS CORP., EUCLID DIV
GENERAL MOTORS OVERSEAS OPERATIONS
Hough Co. The Frank G.
International Harvester Co.
INTERNATIONAL HARVESTER EXPORT CO.
Joost Mfg. Co.
Klockner Humboldt-Deutz A. G.
LETOURNEAU WESTINGHOUSE CO.
MACK TRUCKS, INC.
MICHIGAN TURBO-DOZER—SEE CLARK EQUIPMENT CO.
Minneapolis-Moline Co.
MRS Mfg. Co.
OLIVER CORP., THE
Pence & Co. Inc., Earl H.
Sheppard Co., R.H.
TOURNATRACTORS—SEE LETOURNEAU-WESTINGHOUSE CO.
Westinghouse Air Brake Co. (Pa.)
Westinghouse Air Brake Co., Le Roi Div.
White Motor Co., The, Autocar Div.

ATTACHMENTS

Allis Chalmers Mfg. Co., Buda Div.
Allis-Chalmers Manufacturing Co., Const. Machy. Div.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
American Tractor Equipment Corp.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Ateco—see American Tractor Equip. Corp.
BUCYRUS-ERIE—SEE INTERNATIONAL HARVESTER EXPORT CO.
Carco—see Pacific Car & Foundry Co.
Carroll Tractor Parts—see Craig Carroll Co.
Caterpillar Tractor Co.
CLARK EQUIPMENT CO., CONST. MACHY. DIV.
Craig Carroll Co.
Drott Mfg. Corp.
EIMCO CORP., THE
ELECTRIC STEEL FOUNDRY CO., Gar Wood Industries Inc.
GENERAL MOTORS OVERSEAS OPERATIONS
Heil Co., The
Hensley Equip. Co.
Hercules Gallion Products, Inc.
HOUGH—SEE INTERNATIONAL HARVESTER EXPORT CO.
Hough Co., The Frank G.
Hyster Co.
International Harvester Co.
INTERNATIONAL HARVESTER EXPORT CO.
LE TOURNEAU-WESTINGHOUSE CO.
OLIVER CORP., THE
Pacific Car & Foundry Co.
Pence & Co., Inc., Earl H.
PULLMAN—SEE INTERNATIONAL HARVESTER EXPORT CO.
Service Supply Corp.
Skid-Shovel—see Drott Manufacturing Corp.
Taylor-Wharton Iron & Steel Co.
TOURNAPULL—SEE LE TOURNEAU-WESTINGHOUSE CO.
Tracto-Rippers — see Tractomotive Corp.
Tracto-shovel — see Tractomotive Corp.
Tractomotive Corp.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Le Roi Div.

TRAILERS

See Trucks and Trailers

TRAMMERS

See Locomotives

TRAMWAYS, AERIAL

BUCKETS

AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
RIBLET TRAMWAY CO.
Sanford-Day Iron Works Inc.
STEARNS-ROGER MFG. CO.
U. S. STEEL CORP., AMERICAN STEEL & WIRE DIV.
Yara Engineering Corp., Interstate Equipment Div.

CABLE

BETHLEHEM PACIFIC COAST STEEL CORP.
Bodinson Mfg. Co.
British Ropes Ltd.
Canada Wire & Cable Co., Ltd.
Leschen Wire Rope Div., H. K. Porter Co.
RIBLET TRAMWAY CO.
Roeblings Sons Corp.
SAUERMAN BROS., INC.
UNITED STATES STEEL EXPORT CO.
Washington Iron Works

TOWERS

Bodinson Mfg. Co.
Gregg Co., Ltd., The
RIBLET TRAMWAY CO.
SAUERMAN BROS., INC.
STEARNS-ROGER MFG. CO.
TELLURIDE IRON WKS.
Yara Engineering Corp., Interstate Equipment Div.

TRANSFERS, CAR

AMERICAN MINE DOOR COMPANY
Atlas Car & Mfg. Co., The
Bodinson Mfg. Co.
CANTON—SEE AMERICAN MINE DOOR COMPANY
CARD IRON WORKS CO., THE C. S.
Gregg Co., Ltd., The
International Engineering, Inc.
MAYO TUNNEL & MINE EQUIP.
Ogden Iron Works Co.
Sanford-Day Iron Works Inc.
TELLURIDE IRON WORKS CO.

TRANSITS

See Surveying Instruments & Equipment

TRANSMISSIONS AND TORQUE CONVERTERS

See also Torque Converters
ALLISON—SEE GENERAL MOTORS OVERSEAS OPERATION
American Blower Div. of American Standard
Berry—see Oliver-Iron & Steel Corp.
Caterpillar Tractor Co.
Cleveland Worm & Gear Co., The
Dodge Mfg. Corp.
Flexidyne—see Dodge Mfg. Corp.
General Motors Corp., Allison Div.
GENERAL MOTORS OVERSEAS CORP.
Koppers Co., Fast's Coupling Dept.
Lima Electric Motor Co.
National Supply Co., The
Oliver Iron & Steel Corp.
Philadelphia Gear Works, Inc.
Reeves—see Reliance Electric & Engineering Co.
Reeves Pulley Co.
Reliance Electric & Engineering Co.
Schneider Mfg. Corp.
Sterling Electric Motors, Inc.
TWIN DISC CLUTCH CO.
U. S. Electrical Motors, Inc.
Varidrive—see U. S. Electrical Motors, Inc.
Western Gear Corp. (Lynwood)
Western Gear Corp. (Wash.)
Western Gear Corp. Pacific Gear Plant

TRIPPERS

See Conveyor Equipment

TROLLEY EQUIPMENT

See also Locomotives
COLORADO FUEL & IRON CORP.
Elreco Corp. The
JEFFREY MFG. CO.
Mosebach Electric & Supply Co.
Ohio Brass Co.
Ohio Hoist & Mfg. Co.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

TROMMELS

See Screens, Grizzlies, and Accessories

TRUCKS

See Cars, Mine

TRUCK AND TRAILERS

See also Haulage Units

ON HIGHWAY

ALLISON STEEL MFG. CO.
Autocar—see White Motor Co., The, Autocar Trucks Div.
Chrysler Corp., Dodge Div.
Dart Truck Co.
FWD—Four Wheel Drive Auto Co., The
Federal Motor Truck Co.
Four Wheel Drive Auto Co., The
Fruehauf Trailer Co.
Galion Allsteel Body Co.
General Motors Corp., GMC Truck & Coach Div.
GENERAL MOTORS OVERSEAS OPERATIONS
Hercules Steel Products
INTERNATIONAL—SEE INTERNATIONAL HARVESTER EXPORT CO.
International Harvester Co.
INTERNATIONAL HARVESTER EXPORT CO.
KENWORTH MOTOR TRUCK CORP.
Klockner-Humboldt-Deutz Ag
KOEHRING CO.
MACK TRUCKS INC.
Napco Industries, Inc.
Rogers Bros., Corp.
White Motor Co., The, Autocar Trucks Div.

OFF-HIGHWAY

Athey Products Corporation
Autocar—see The White Motor Co., Autocar Trucks Div.
Chrysler Corp., Dodge Div.
Dart Truck Co.
Easton Car & Construction Co.
Enterprise Engine & Mach. Co.
EUCLID — SEE GENERAL MOTORS OVERSEAS OPERATIONS
EUCLID DIV., GENERAL MOTORS CORP.
FWD—Four Wheel Drive Auto Co., The
Federal Motor Truck Co.
Four Wheel Drive Auto Co., The
Fruehauf Trailer Co.
Galion Allsteel Body Co.
GENERAL MOTORS CORP., EUCLID DIVISION
GENERAL MOTORS OVERSEAS OPERATIONS
GETMAN BROS. MFG. DIV. INC.
Heil Co., The
Hercules Steel Products Co.
INTERNATIONAL—SEE INTERNATIONAL HARVESTER EXPORT CO.
INTERNATIONAL HARVESTER CO.
INTERNATIONAL HARVESTER EXPORT CO.
Irwin Foundry & Mine Car Co.
KENWORTH MOTOR TRUCK CORP.
KOEHRING CO.
Landis Steel Co.
LE TOURNEAU WESTINGHOUSE CO.
MACK TRUCKS INC.
Marmon-Herrington Co., Inc.
Napco Industries, Inc.
Ore Trucks, Inc.
Rogers Brothers Corp.
SCOOT-CRETE — SEE GETMAN BROS. MFG. DIV., INC.
TOURNAHOPPER—SEE LETOURNEAU-WESTINGHOUSE CO.
TOURNAROCKER—SEE LETOURNEAU-WESTINGHOUSE CO.
Westinghouse Air Brake Co. (Pa.)
White Motor Co., The Autocar Trucks Div.

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TRUCK OR TRAILER BODIES

ALLISON STEEL MFG. CO.
Easton Car & Construction Co.
Enterprise Engine & Mach. Co.
Fruehauf Trailer Co.
Gallion Allsteel Body Co.
Gar Wood Industries Inc.
GENERAL MOTORS OVERSEAS OPERATIONS
Gregg Co. Ltd., The
Heil Co., The
Hercules Steel Products Co.
Hockensmith Corp., The
Landis Steel Co.
Penn—see Hockensmith Corp.
Schwartz Mfg. Co.
WINTER WEISS CO.

TUNGSTEN CARBIDE PRODUCTS

Adamas Carbide Corp.
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Atlas Copco, AB Sweden
Atlas Copco Eastern, Inc.
ATLAS COPCO PACIFIC, INC.
BRUNNER & LAY, INC.
Carboloy—see General Electric Co.
Firth Sterling Inc.
Firthite—see Firth Sterling Inc.
General Electric Company—Carboloy Dept.
Haynes Stellite Co.
Haystellite—see Haynes Stellite Co.
INTERNATIONAL GENERAL ELECTRIC CO.
Intra-Set—see Brunner & Lay, Inc.
Junction Bit & Tool Co.
KENNAMETAL INC.
LONGYEAR CO., E. J.
Manchester Bit Corp.
McCauley Industrial Corp.
Metal Carbide Corp.
National Carbon Co.
National Carbide Co.
ROK-BITS—SEE BRUNNER & LAY, INC.
STOODY CO.
Uddeholm Co. of America
Vascoloy-Ramet Corp.
WESTERN ROCK BIT MFG. CO.

VACUUM FILTERS

See Filters

VACUUM PUMPS

See Pumps

VALVES

ALLEN-SHERMAN-HOFF PUMP CO., THE, DEPT. J.
ACF Industries, Inc., American Car & Foundry Div.
American Chain & Cable Co., Inc., R P & C Valve Div.
American Hard Rubber Co.
American Locomotive Co.
Barrett, Haentjens & Co.
Black, Sivalls & Bryson, Inc.
Bridgeport Brass Co.
Bristol Co., The
Chase Brass & Copper Co.
Coeur d'Alene Hardware & Foundry Co.
Crane Co.
Duriron Co. Inc., The
ELECTRIC STEEL FOUNDRY CO.,
EQUIPMENT ENGINEERS, INC.
Farris Flexible Valve Corp.
Farval Corp., The
Flex—see Farris Flexible Valve Corp.
FLEX-CHECK—SEE THE ALLEN-SHERMAN-HOFF PUMP CO.
Flexible Valve Corp.
Foster Engineering Co.
Goodrich Co., B. F.
Grinnell Co., Inc.
Grinnell-Saunders—see Grinnell Co., Inc.
Hazelton—see Barrett, Haentjens & Co.
KREBS—SEE EQUIPMENT ENGINEERS, INC.
Lead Lined Iron Pipe Co.
LEDEEN MFG. CO.
Lunkenheimer Co., The
MASSCO GRIGSBY—SEE MINE & SMELTER SUPPLY CO., THE
Matheson Co., Inc., The
McNally Pittsburg Co.
MINE & SMELTER SUPPLY CO.,
Minneapolis-Honeywell Regulator Co., Industrial Div.
Ohio Brass Co.
Pacific Pipe Co.
Philadelphia Gear Wks., Inc.
Porter Co., Inc., H. K., WS Fittings Div.
Rockwell Mfg. Co.
R-P&C Valve Div., American Chain & Cable Co., Inc.
Super-Seal Flex—see Farris Flexible Valve Corp.
United States Rubber Co.
Victaulic Co. of America
Walworth Co.
WESTERN PRECIPITATION CORP.
Westinghouse Air Brake Co., Cleveland Rock Drill Div.
Westinghouse Air Brake Co., Industrial Products Div.

VENTILATION EQUIPMENT AND BLOWERS

BRATTICE CLOTH AND TUBING

AMERICAN BRATTICE CLOTH CORP.
Bemis Bro. Bag Co.

MINE FANS AND BLOWERS

AERODYNE—SEE JEFFREY MFG. CO., THE
American Air Filter Co., Inc.
American Blower Div. of American Standard
AXIVANE—SEE JOY MFG. CO.
Brownie—see Sanford-Day Iron Wks.
Cleveland Worm & Gear Co., The
Druco-flo—see Drullard Co., Howard
Drullard Co., Howard
GRAYBAR ELECTRIC CO., INC.,
Homelite Corp.
International Engr., Inc.
JEFFREY MFG. CO.
JOY MFG. CO.
Koppers Co., Inc.
NORTHERN BLOWER CO.
Propellair—see Robbins & Myers, Inc.
Robbins & Myers, Inc.
Roots-Connersville Blower
Sanford-Day Iron Wks.
Standard Elec. Mfg. Co., Inc.
Sutorbelt Corp.
U. S. Hoffman Machinery Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Westinghouse Electric Corp., Sturtevant Div.

VENTILATION PIPE

AMERICAN BRATTICE CLOTH CORP.
Armco Drainage & Metal Products, Inc.
Ayrtube—see Flexible Tubing Corp.
Bemis Bro. Bag Co.
Coppus Engineering Corp.
DeLaval Steam Turbine Co.
Druco-vent—see Drullard Co., Howard
Drullard Co., Howard
DU PONT DE NEMOURS & CO., INC., FABRICS DIV.
Fagertun Fabrikker A/S
Flexible Tubing Corp.
Goodrich Co., The B. F.
JOHNS-MANVILLE SALES CORP.,
MINE VENT—SEE AMERICAN BRATTICE CLOTH CORP.
NAYLOR PIPE CO.
NEOLON — SEE AMERICAN BRATTICE CLOTH CORP.
Spiratube—see Flexible Tubing Corp.
TELLURIDE IRON WKS.
TRANSITE — SEE JOHNS-MANVILLE
VENTUBE—SEE DU PONT DE NEMOURS & CO., INC., FABRICS DIV.

VIBRATORS

See Bins, Chutes and Accessories

WASHERS LOG

ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP
All-State Welding Alloys Co., Inc.
Bodinson Mfg Co.
Eagle Iron Works
Georgia Iron Works Co.
Humboldt, Klockner - Humboldt-Deutz, A. G.
Iowa Mfg. Co.
Klockner-Humboldt-Deutz, A. G.
LAKE SHORE INC.
LINK-BELT CO.
Lippmann Engineering Works
McLanahan & Stone Co.
McNally Pittsburgh Co.
Pioneer Engineering Div., Poor & Co., Inc.
Smith Engineering Works
Universal Engr. Corp.
Washington Machinery Co.
Yuba Mfg. Co.

WELDING EQUIPMENT, SUPPLIES AND SERVICES

EQUIPMENT

Abrasaweld—see Lincoln Electric Co.
Airco—see Air Reduction Sales Co.
Air Reduction Sales Co.
All State Welding Alloys Co., Inc.
AMERICAN BRAKE SHOE CO. AMERICAN MANGANESE STEEL DIV.
American Chain & Cable Co. Inc. Page Steel & Wire Div.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Auto Arc-Weld Mfg. Co.
Fleetweld—see Lincoln Electric Co.
Gar Wood Industries, Inc.
General Electric Co., Apparatus Sales Div.
HARNISCHFEGER CORP.
Hobart Bros. Co.
Ideal arc—see Lincoln Electric Co.
Industrial Air Products Co.
International General Electric Co.
Jetweld—see Lincoln Electric Co.
Lincoln Electric Co.
Linde Air Prod. Co.
Mosebach Electric & Supply Co.
Motor Generator Corp.
Ohio Brass Co.
Shield arc—see Lincoln Electric Co.
Smith Welding Equipment Corp.
TELLURIDE IRON WKS.
Tweco Prod. Inc.
Union Carbide and Carbon Corp. Linde Air Products Company Div.
Victor Equipment Co.
Wall Colmonoy Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.
Wilson-Weld—see Wilson Prod., Inc.
Wilson Prod., Inc.
Worthington Corp.

HARD FACING

Abrasaweld—see Lincoln Electric Co.
Airco—see Air Reduction Sales Co.
Air Reduction Sales Co.
All-State Welding Alloys Co., Inc.
AMERICAN BRAKE SHOE CO., AMER. MANGANESE STEEL DIV.
Ampco Metal Inc.
AMPCO-Trode—see Ampco Metal, Inc.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Auto Arc Weld Mfg. Co., The
Crucible Steel Co. of America
Eutectic Welding Alloys Corp.
Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus Sales Div.
HARNISCHFEGER CORP.
Hascrome—see Haynes Stellite Co.
Haynes Stellite Co.
Haystellite—see Haynes Stellite Co.
Idealarc—see Lincoln Electric Co.
Industrial Air Products Co.
Jetweld—see Lincoln Electric Co.
KENNAMETAL, INC.
Lincoln Electric Co.
Linde Air Products Co.
Motor Generator Corp.
Ranite—see Rankin Mfg. Co.
RESISTO-LOY CO.
Rexweld—see Crucible Steel Co. of Amer.
Sanford-Day Iron Works Inc.
Seaco—see Stuls-Sickles Co.
Shieldarc—see Lincoln Electric Co.
STOODY CO.
Stuls-Sickles Co.
Taylor-Wharton Iron & Steel Co.
Union Carbide and Carbon Corp. Haynes Stellite Co. Div.
Union Carbide and Carbon Corp. Linde Air Products Co. Div.
Victor Equipment Co.
Wall Colmonoy Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

WELDING RODS

Abrasaweld—see Lincoln Electric Co.
Airco—see Air Reduction Sales Co.
Air Reduction Sales Co.
All-State Welding Alloys Co., Inc.
AMERICAN BRAKE SHOE CO. AMERICAN MANGANESE STEEL DIV.
American Chain & Cable Co., Inc., Page Steel & Wire Div.
AMPCO Metal, Inc.
AMPCO-Trode—see AMPCO Metal, Inc.
AMSCO—SEE AMERICAN BRAKE SHOE CO.
Bridgeport Brass Co.
Crucible Steel Co. of America
Eutectic Welding Alloys Corp.
Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus Sales Div.
HARNISCHFEGER CORP.
Haynes Stellite Co.
Hastelloy—see Haynes Stellite Co.
Hobart Bros. Co.
Ideal Arc—see Lincoln Electric Co.
Industrial Air Products Co.
International General Electric Co.
Jetweld—see Lincoln Electric Co.
Lincoln Electric Co.
Linde Air Prod. Co.
Manganal—see Stuls-Sickles Co.
Motor Generator Corp.
Multimet—see Haynes Stellite Co.
Phos-Trode—see AMPCO Metal, Inc.
Resisto-Loy Co.
Revere Copper & Brass Inc.
Rexintal Stainless—see Crucible Steel Co. of Amer.
Shield Arc—see Lincoln Electric Co.
Stuls-Sickles Co.
Taylor-Wharton Iron & Steel Co.
Tweco-Lite Aluminum Welding Cable—see Tweco Products, Inc.
Tweco Products, Inc.
Union Carbide and Carbon Corp. Linde Air Products Co. Div.

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Victor Equipment Co.
Westinghouse Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

GENERAL SUPPLIES

Abrasweld—see Lincoln Electric Co.
Airco—see Air Reduction Sales Co.
Air Reduction Sales Co.
All State Welding Alloys Co., Inc.
American Chain & Cable Co. Inc., Page Steel & Wire Div.
American Optical Co.
Deveon Corp.
Deveon Plastic Steel—see Deveon Corp.
Fleetweld—see Lincoln Electric Co.
General Electric Co., Apparatus Sales Div.
Hobart Bros. Co.
Ideal Arc—see Lincoln Electric Co.
Industrial Air Products Co.
INTERNATIONAL GENERAL ELECTRIC CO.
Jetweld—see Lincoln Electric Co.
Lincoln Electric Co.
Linde Air Prod. Co.
MINE SAFETY APPLIANCES CO.
Motor Generator Co.
Shield Arc—see Lincoln Electric Co.
SIMPLEX WIRE & CABLE CO.
Smith Welding Equipment Corp.
Union Carbide and Carbon Corp. Linde Air Products Co. Div.
Victor Equipment Co.
Westinghouse & Electric Corp.
WESTINGHOUSE ELECTRIC INTERNATIONAL CO.

WELDMENTS, STEEL

Falk Corp., The

WINCHES

See also Hoisting Equipment

ELECTRIC

Beaumont—see International Combustion Ltd.
Beebe Bros.
Bodinson Mfg. Co.
Brownie—see Sanford-Day Iron Wks.
CHICAGO PNEUMATIC TOOL CO.
HARNISCHFEGER CORP.
International Combustion Ltd.
LAKE SHORE, INC.
LEDEEN MFG. CO.
LINK-BELT CO.
Lug-All Co., The
MOBILE DRILLING, INC.
Ohio Hoist & Mfg. Co.
R & M—see Robbins & Myers, Inc.
Robbins & Myers, Inc.
Round Chain Cos.
Sanford-Day Iron Wks.
SAUERMAN BROS., INC.
Shepard Niles Crane & Hoist Corp.
STEPHENS-ADAMSON MFG. CO.
VULCAN-DENVER—SEE VULCAN IRON WORKS (DENVER)
VULCAN IRON WORKS (DENVER)
Western Gear Corp. (S. F.)
Westinghouse Electrical Corp.
Yale and Towne Mfg. Co.
Yuba Manufacturing Co.

HAND

Beebe Bros.
Bodinson Mfg. Co.
Channon Corp., J. H.
Christian Engineers, J. D.
Clyde Iron Wks., Inc.
Coeur d'Alene Hardware & Foundry Co.
GRIPHOIST, INC.
HARNISCHFEGER CORP.
LEDEEN MFG. CO.
LINK-BELT CO.
Lug-All Co.
Ohio Hoist & Mfg. Co.
Pacific Car & Foundry Co.
Roberts & Schaefer Co.
Round Chain Cos.
SAUERMAN BROS., INC.
STEPHENS-ADAMSON MFG. CO.
Western Gear Corp. (S. F.)
Yale and Towne Mfg. Co.
Yuba Manufacturing Co.

WIRE

See Cable and Conduit

WIRE CLOTH

See Screens, Grizzlies, and Accessories

WIRE ROPE

See Rope, Wire

XANTHATES

See Reagents and Chemicals

SECTION II

Manufacturer's Index

Advertisers in Boldface

SECTION II contains an alphabetical list of the names and complete addresses of the principal manufacturers of specialized MINE-MILL-SMELTER equipment. The names of manufacturers who are represented in this issue by catalogs or advertisements are printed in BOLDFACE type.

A

A & A Mfg. Co., 2017 W. Clybourn St., Milwaukee 3, Wis.
Asea, Vasteras, Sweden
Abrams Aerial Survey Corp., 606 East Shiawassee St., Lansing 1, Mich.
A.C.F. Industries, Inc., American Car & Foundry Div., 30 Church St., N.Y. 8, N.Y.
ACKER DRILL CO., INC., 725 W. LACKAWANA AVE., SCRANTON 3, PA.
Adamas Carbide Co., 121 Market St., Kenelworth, N.J.
Advance Car Mover Co., Inc., 112 N. Outagamie St., Appleton, Wis.
Aero Service Corp., 210 E. Courtland St., Phila. 20, Pa.
Aero Service Corp. (MidContinent) 1401 S. Detroit St., Tulsa, Okla.
Aero Service Corp. (Western) 33 Richards St., Salt Lake City, Utah
African Surveys (Proprietory Ltd.) 44 Negget St., Johannesburg, U. of So. Africa.
AGENCE MINIERE & MARITIME S. A., 2 RUE VAN BREE, ANVERS, BELGIUM
Ainsworth Wm., & Sons, Inc., 2151 Lawrence St., Denver 5, Colo.
Air Placement Equip. Co., 1009-11 W. 24th St., Kansas City 8, Mo.
Air Reduction Sales Co., 150 East 42nd St., New York 17 N.Y.
Alco Products, Inc., Schenectady 5, N.Y.
Alderman, Jr., Sidney S.
Aldon Company, The, 3333 Ravenswood Ave., Chicago 13, Ill.
All-State Welding Alloys Co., Inc., 249-55 Ferris Ave., White Plains, New York
Allen & Garcia Co., 332 S. Michigan Ave., Chicago 4, Ill.
ALLEN-SHERMAN-HOFF PUMP CO., THE, 259 E. LANCASTER AVE., WYNNEWOOD, PA.
Alliance Machine Co., Alliance, Ohio.
Allied Chemical & Dye Corp., Barrett Div., 40 Rector St., New York 6, N.Y.
Allied Chemical & Dye Corp., General Chemical Div., 40 Rector St., New York 6, N.Y.
Allied Geophysics, P.O. Box 583, San Jose, Calif.
Allied Steel & Tractor Products, Inc., 7885 Broadway, Cleveland 5, Ohio
Allied Witan Co., Inc., P.O. Box 2770, Cleveland, Ohio
Allis-Chalmers Mfg. Co., Buda Div., 1185 S. 70th St., Milwaukee 1, Wis.
ALLIS-CHALMERS MFG. CO., INDUSTRIES GROUP, MILWAUKEE 1, WIS.
Allis-Chalmers Mfg. Co., Construction Machy. Div., Box 512, Milwaukee 1, Wis.
Louis Allis Co., The, 427 E. Stewart St., Milwaukee 1, Wis.
ALLISON STEEL MFG. CO., P.O. BOX 6667, PHOENIX, ARIZ.
ALLOY STEEL & METALS CO., 1343 EAST 55TH ST., LOS ANGELES 58, CALIF.
Alphaduct Wire & Cable Co., P.O. Box 709, New Brunswick, N.J.
Alpine Habaratives, Ltd., 1610 Nevada Ave., Colorado Springs, Colo.
Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.
American Air Filter Co., 215 Central Ave., Louisville 8, Ky.
American Blower Div. of American Standard, Detroit 32, Mich.
AMERICAN BRAKE SHOE CO., 530 5TH AVE., NEW YORK 17, N.Y.
American Brake Shoe Co., Export Div., 230 Park Ave., New York 17, N.Y.
AMERICAN BRAKE SHOE CO., AMERICAN MANGANESE STEEL DIV., 389 E. 14TH ST., CHICAGO HEIGHTS, ILL.
AMERICAN BRATTICE CLOTH CORP., S. BUFFALO ST., WARSAW, IND.
American Chain & Cable Co., Page Steel & Wire Div., Monessa, Pa.
American Chain & Cable Co., Helicord Gage Div., Bridgeport 2, Conn.
American Chain & Cable Co., Inc., American Cable Div., York, Pa.
American Chain & Cable Co., Inc., American Chain Div., Princess & Charles Sts., York, Pa.
American Chain & Cable Co., Inc., Hazard Wire Rope Div., Wilkes-Barre, Pa.
American Chain & Cable Co., Inc., R-P&C Div., Reading, Pa.
American Chain & Cable Co., Inc., Wire Rope Div., 271 S. Pennsylvania Ave., Wilkes-Barre, Pa.
American Chain & Cable Co., Inc., Wright Hoist Div., York, Pa.
American Coldset Corp., 87-89 Court St., Paterson, N.J.
American Cyanamid Co., Explosives Dept., 30 Rockefeller Plaza, New York 20 N.Y.
AMERICAN CYANAMID CO., MINERAL DRESSING DEPT., 30 ROCKEFELLER PLAZA, NEW YORK 20, N.Y.
American Forge Co., Niles, Calif.
American Hard Rubber Co., 93 Worth St., New York 13, N.Y.
American Hoist & Derrick Co., Crosby-Laughlin Div., 63 S. Robert St., St. Paul 1, Minn.
American-LaFrance Corp., 148 E. LaFrance St., Elmira, New York
American Locomotive Co., 30 Church St., N.Y., N.Y.
AMERICAN M.A.R.C., INC., 1601 W. FLORENCE AVE., P.O. BOX 549, INGLEWOOD, CALIF.
AMERICAN MINE DOOR CO., 2071 DUEBER AVE., S. W. CANTON 6, OHIO
American Optical Co., Southbridge, Mass.
American Potash & Chemical Corp., 3030 W. 6th St., Los Angeles 54, Calif.
American Rubber Mfg. Co., 1145 Park Ave., Oakland, Calif.
AMERICAN SMELTING & REFINING CO., 5250 S. STATE & MC CORMICK BLDG., SALT LAKE CITY, UTAH
American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif.
Ampco Metal, Inc., 1715 South 38th St., Milwaukee 46, Wis.
ANACONDA WIRE & CABLE CO., 25 BROADWAY, NEW YORK CITY 4, N.Y.
Analytical Measurements, Inc., 585 Main St., Chatham, N.J.
Andreds Stihl Maschinenfebrick, Waiblingen Newstadt/Wurtt, Germany
Ansonia Wire & Cable Co., The, 11 Martin St., Ashton, Rhode Island
Apache Powder Co., Box 518, Benson, Arizona
Appleton-Atlas Car Mover Corp., 1421-25 S. 2nd St., Milwaukee 4, Wisconsin
Arizona Assay Office, 815 N. First St., Phoenix, Ariz.
Arizona Bag Co., 1502 So. 23rd Ave., Phoenix Ariz.
ARIZONA TESTING LABORATORIES, 917 WEST MADISON ST., P.O. BOX 1388 PHOENIX, ARIZ.
Armco Drainage & Metal Products, Inc., 703 Curtis St., Middletown, Ohio
Armco Steel Corp., 703 Curtis St., Middletown, Ohio
Armour Chemical Division, 1355 West 31st St., Chicago 9, Ill.
Armstrong-Bray & Co., 5366 Northwest Highway, Chicago 30, Ill.

AROS ELECTRIC, INC., 16 E. 71ST ST., N.Y.C., N.Y.—SEE ASEA
Athey Products Corp., 5651 West 65th St., Chicago 38, Ill.
Atlantic Refining Co., The, 260 South Broad St., Philadelphia 2, Pa.
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland 10, Ohio
Atlas Copco Eastern, Inc., P.O. Box 2568, Paterson 25, N.J.
ATLAS COPCO PACIFIC, INC., 930 BRITTAN AVE., SAN CARLOS, CALIF.
Atlas Copco, A. B. Stockholm 1, Sweden
Atomic Engineering Corp., 424 S. 7th St., P. O. Box 1701 Grand Junction, Colo.
ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE
Auto Arc-Weld Mfg. Co., The, 9615 Meech Ave., Cleveland 5, Ohio
Autocar Trucks Division, White Motor Co., Exton, Pa.

B

B.I.F. Industries, Inc., 345 Harris St., Providence, R.I.
BABCOCK & WILCOX CO., THE, 161 EAST 42ND ST., NEW YORK 17, N.Y.
Badger Fire Extinguisher Co., Chase St., Methuen, Mass.
Baldwin-Lima-Hamilton Corp., Dept. 6043, Philadelphia 42, Pa.
Baldwin-Lima-Hamilton Corp., Eddystone Div., Philadelphia 42, Pa.
BALDWIN-LIMA-HAMILTON CORP., LIMA-HAMILTON DIV., PHILADELPHIA 42, PA.
Band It Co., 24th & Dahlia, Denver 16, Colo.
Barber-Colman Co., 1300 Rock St., Rockford, Ill.
Barber-Greene Co., 400 North Highland Ave., Aurora, Illinois
Barco Mfg. Co., 500 Hough St., Barrington, Illinois
Barrett, Haentjens & Co., P.O. Box 36 Hazleton, Pa.
Bartell, A.O., 308 Woodlark Bldg., Portland, Ore.
Bath Iron Wks. Corp., Rm. 1738, West Chester, Pa.
Baukol, Philip J., 2131 University Ave., Berkeley, Calif.
Bausch & Lomb Optical Co., 632 St. Paul St., Rochester, New York
Bay City Shovels, Inc., Bay City, Mich.
Beckman Instruments, Inc., Scientific Instruments Div., 2500 Fullerton Road, Fullerton, Calif.
Beebe Bros., 2724 Sixth Ave., S. Seattle 4, Wash.
BELL HELICOPTER CO., P.O. BOX 482, FT. WORTH 1, TEXAS
Bemis Bros Bag Co., 111 North Forth St., Box 23, St. Louis 2, Mo.
Bendelari, F.N., First National Bank, Joplin, Mo.
Bennetts Chemical Laboratory, Inc., 901 S. Ninth Street, Tacoma 8, Wash.
Berger & Sons, Inc., C.L., 37 Williams St., Boston 19, Mass.
F. W. Berk & Co., Inc., 55 New Montgomery St., San Francisco 5, Calif.
Berk & Co., Inc., F.W., Park Place East Wood Ridge, N.J.
Berman Chem. Co., 712 Superior St., Toledo 4, Ohio
BETHLEHEM PACIFIC COAST STEEL CORP., 20TH & ILLINOIS STREETS, SAN FRANCISCO, CALIFORNIA
Bethlehem Steel Co., Bethlehem, Pa.
Bethlehem Steel Export Corp., 25 Broadway, N.Y. 4, N.Y.
Bico., Inc., 3116 Valhalla Drive, Burbank, Calif.
Bin-Dicator Co., The, 13946 Kercheval Ave., Detroit 15, Mich.
Bird Machine Co., South Walpole, Mass.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Bixby-Zimmer Engineering Co., 961 Abingdon St., Galesburg, Ill.
BLACK & DEASON, BOX 1888 SALT LAKE CITY 1, UTAH
Black, Sivalls & Bryson, Inc., 7500 E. 12th St., Kansas City 26, Mo.
Blackhawk Mfg. Co., Milwaukee 46, Wis.
Blaw-Knox Co., Blaw-Knox Div., Farmers Bank Bldg., Pittsburgh, Pa.
Bodinson Mfg. Co., 2401 Bayshore Blvd., San Francisco 24, Calif.
Bonded Scale & Machine Co., 69 Kingston, Columbus, Ohio
BOOTH CO., INC., THE 333 W. 14TH ST., SALT LAKE CITY 4, UTAH
Borg-Warner Ind.—see Morse Chain Co., N.Y.
Boston Woven Hose & Rubber Co., P. O. Box 1071, Boston 3, Mass.
Bowdil Co., The, Boylan Ave., S. E. Canton, Ohio
BOYLES BROS. DRILLING CO., 1221 S. MAIN ST., SALT LAKE CITY, UTAH
BOYLES BROS. DRILLING CO., LTD., 1275-91 PARKER ST., VANCOUVER 6, B.C., CANADA
Braun & Co., C. F. Alhambra, Calif.
Braun Corp., 2260 E. 15th St., Los Angeles 21, Calif.
Braun-Knecht-Heiman Co., 1400 16th St., San Francisco 19, Calif.
Bridgeport Brass Co., 30 Grand St., Bridgeport, Conn.
Briggs & Stratton Corp., 2711 North Thirteenth St., Milwaukee 1, Wis.
Bristol Co., The, P.O. Box 1790 MW Waterbury 20, Conn.
British Ropes Ltd., Export Sales Div., 82 High Holborn, London, England
BROWN INC., DAVID, 999 BEECHER ST., SAN LEANDRO, CALIF.
BRUNNER & LAY, INC., 9300 KING ST., FRANKLIN PARK, ILL.
Buck & Associates, Carl, Essex Falls, N.J.
BUCYRUS-ERIE CO., P.O. BOX 56, SOUTH MILWAUKEE, WIS.
Buda Co., (Div. of Allis-Chalmers Mfg. Co.), Harvey, Ill.
Buell Engineering Co., Inc., 70 Pine St., New York 5, New York.
Bullard Co., E. D., 2680 Bridgeway, Sausalito, Calif.
BUNKER HILL & SULLIVAN MINING & CONCENTRATING CO., BOX 29, KELLOGG, IDAHO
Butler Mfg. Co., 7400 E. 13th St., Kansas City 26, Mo.
Byron Jackson Pumps, Inc., P.O. Box 2017A, Terminal Annex, Los Angeles, Calif.

C

C & D Batteries, Inc., Conshohocken, Pa.
C M G Industries Inc., 615 S. 2nd St., Laramie, Wyo.
California Texas Oil Co., Ltd., 380 Madison Ave., New York, N.Y.
Calumet & Hecla, Inc., Calumet Div., 1 Calumet Ave., Calumet, Mich.
Canada Wire & Cable Co., Ltd., P. S. "R." Toronto 17, Ontario, Canada
Canadian Aero Service Ltd., 348 Queen St., Ottawa 4, Ontario, Canada
Canadian Safety Fuse Co. Ltd., Brownsburg, Quebec, Canada
Canton Mfg. Co., 2408 13th St. N. E., Canton 5, Ohio
Carborundum Co., The, Refractories Div., Perth Amboy, N.J.
CARD IRON WORKS CO., THE C. S., P.O. BOX 117, DENVER 1, COLO.
Cardox Corp., 307 N. Michigan Ave., Chicago, Ill.
Carey, Philip, Mfg. Co., Wayne Ave. At Cooper, Cincinnati, Ohio
Carlon Products Corp., 10225 Meech Ave., Cleveland 5, Ohio
Carlyle Rubber Co., Inc., 103-107 Warren St., New York 7, N.Y.
Carpco Mfg. Inc., P.O. Box 3272, Jacksonville 6, Fla.
Carrier Corp., 300 So. Geddes St., Syracuse, N.Y.
Carrier Conveyor Corp., 211 N. Jackson St., Louisville, Ky.
Caterpillar Tractor Co., Peoria, Illinois
CEMENT GUN CO., ALLENTOWN, PA.
Central Frog & Switch Co., The, Box 95, Sta. O, Cincinnati 8, Ohio
Central Mine Equipment Co., 6200 N. Broadway, St. Louis 15, Mo.
Central Scientific Co. of California, 1040 Martin Ave., Santa Clara, Calif.
Centrifugal & Mechanical Industries, Inc., 146 President St., St. Louis 18, Mo.
Chain Belt Co., 4701 West Greenfield Ave., Milwaukee 1, Wis.
Chain Belt Co., Shafer Bearing Div., Downers Grove, Illinois
Channon Corp., J. H., 1447-55 West Hubbard St. Chicago 22, Ill.
CHAPMAN & WOOD, 536 JEFFERSON ST., N. E. ALBUQUERQUE, NEW MEX.
Chapman Dyer Steel Co., 820 S. Euclid Tucson, Ariz.
Charlton Laboratories, 2340 S. W. Jefferson St., Portland 7, Ore.
Chase Brass & Copper Co., 236 Grand St., Waterbury 20, Conn.
Chester Hoist—see National Screw & Mfg. Co.
Chicago Eye Shield Co., 2300 Warren Blvd., Chicago 12, Ill.
CHICAGO PNEUMATIC TOOL CO., 8, EAST 44TH ST., NEW YORK, N.Y.
CHIKSAN CO., 320 N. POMONA AVE., BREA, CALIF.
CHRISTENSEN DIAMOND PRODUCTS CO., 1937 S 2ND WEST P.O. 367, SALT LAKE CITY, UTAH
Christian Engineers, J.D., 490 Potrero Ave., San Francisco 10, Calif.
Chrysler Corp.-Dodge Div., 21500 Mound Road, Detroit 31, Mich.
Circle Wire & Cable Corp., 5500 Maspeth Ave., N. Maspeth, N.Y.
CLARK EQUIPMENT CO., CONSTRUCTION MACHINERY DIV., P.O. BOX 599, PIPESTONE PLANT BENTON HARBOR, MICH.
Clarkson Co. The, 564 Market St., San Francisco 4, Calif.
Cleveland Rock Drill Div., Westinghouse Air Brake Co., Cleveland, Ohio
Cleveland Vibrator Co., The, 2828 Clinton Ave., Cleveland 13, Ohio
Cleveland Wire Cloth & Mfg. Co., 3573 E. 78th St., Cleveland 5, Ohio
Cleveland Worm & Gear Co., The, 3249 East 80th St., Cleveland 4, Ohio
Climax Molybdenum Co., 500 Fifth Ave., N.Y. 36, N.Y.
Clipper Belt Lacer Co., 974 Front Ave., N.W., Grand Rapids 2, Mich.
Clyde Iron Works, Inc., Duluth 1, Mich.
COAST MFG. & SUPPLY CO., BOX 71, LIVERMORE, CALIF.
Coeur d'Alene Hardware & Foundry Co., Box 969, Wallace, Idaho
Coffing Hoist Div., Duff Norton Co., Danville, Ill.
Collyer Insulated Wire Co., 245 Roosevelt Ave., Pawtucket, R.I.
Colonial Plastics Mfg. Co., 2685 E. 79th St., Cleveland 4, Ohio
COLORADO ASSAYING CO., THE, 2013 WELTON ST., DENVER 1, COLO.
COLORADO FUEL & IRON CORP., P.O. BOX 1920, DENVER, COLO.
COLORADO IRON WORKS CO., 3800 RACE ST., DENVER 5, COLO.
Columbia Steel Casting Co., Inc., 933 N. W. Johnson St., Portland 9, Ore.
COLUMBIAN STEEL TANK CO., 1509 WEST 12TH ST., KANSAS CITY 1, MO.
Combustion Engineering Inc., Raymond Div., 1315 N. Branch St., Chicago 22, Ill.
Combustion Engineering, Inc., 200 Madison Ave., New York 16, New York
Commercial Shearing & Stamping Co., 1775 Logan Ave., Youngstown 1, Ohio.
Connecticut Telephone & Electric Corp., Meriden, Conn.
Connellsville Mfg. & Mine Supply Co., S. 4th St Connellsville, Pa.
Consolidated Pneumatic Tool Co. Ltd., 282 Davis Rd., London, S. W. 6, England
Construction Mach. Co., Box 120, Waterloo, Iowa
Continental Gin Co., 4500-5th Ave., South, Birmingham, Ala.
Continental Motors Corp., 205 Market St., Muskegon, Mich.
Convair Inc., P. O. Box 9671, Pittsburgh 26, Pa.
Conveyor Co., The, 3260 East Slauson Ave., Los Angeles 58, Calif.
Cooper-Bessemer Corp., The, Mount Vernon, Ohio
Coppus Engineering Corp., 563 Park Ave., Worcester 2, Mass.
Craig Carroll Co., 1704 S.E. 22nd Ave., (Box 2208), Portland 15, Oregon
Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.
Crescent Belt Fastener Co., 480 Lexington Ave., New York 17, N.Y.
Crucible Steel Co. of America, Henry W. Oliver Bldg., Mellon Square, P.O. Box 88, Pittsburgh 30, Pa.
Crusher Eng. Div., Poor & Co., 400 Architects Bldg., Philadelphia 3, Pa.
Cummins Engine Co., Inc., Fifth & Union St., Columbus, Ind.
Custom Assay Office, Box 811, El Paso, Texas
Cutler-Hammer, Inc., 315 N. 12th St., Milwaukee 1, Wis.

D

Dart Truck Co., 2623 Oak St., Kansas City 8, Mo.
Davey Compressor Co., Kento, Ohio
Davis & Davis, 2532 Lambourne Ave., Salt Lake City, Utah.
Dayton Rubber Co., Woodside Bldg., Greenville, S. C.
Deason & Nichols, 160 South West Temple St., Salt Lake City 1, Utah
DEGGENDORFER, T. G., BOX 840, KELLOGG, IDAHO
DEISTER CONCENTRATOR CO., 925 GLASGOW AVE., FORT WAYNE, IND.
Deister Machine Co., 1933 E Wayne St., Ft. Wayne 4, Ind.
Deming Co., Salem, Ohio
DENVER EQUIPMENT CO., Box 5268 (1400-17TH ST.), DENVER 17, COLO.
Denver Fire Clay Co., 2301 Blake St., P.O. Box 5510, Denver 17, Colorado
Detectron Corp., 5528 Vineland Ave., North Hollywood, Calif.
DeLaval Steam Turbine Co., 300 Nottingham Way, Trenton 2, N. J.
Devcon Corp., Danvers, Mass
DIAMOND DRILL CONTRACTING CO., SOUTH 18 STONE ST., P.O. BOX 4065, STATION B., SPOKANE, WASHINGTON
Diamond Iron Works Div., Goodman Mfg. Co., Halsted St., & 48th Pl., Chicago 9, Ill.

DIAMOND TOOL RESEARCH CO., INC., 380 2ND AVE., N.Y. 10, N.Y.
Diamond Tool Research Co., Inc., 402 Kentucky Ave., Indianapolis, Ind.
Dicalite Div., Great Lakes Carbon Corp.
Dickinson Laboratories, 1300 W. Main St., Box 7006, El Paso, Texas
DIESEL ENERGY CORP., 52 BEAVER ST., NEW YORK, N.Y.—SEE KLOCKNER-HUMBOLDT-DEUTZ
Dietzgen Co., Eugene, 2425 North Sheffield, Chicago, Ill.
DIFFERENTIAL STEEL CAR CO., FINDLAY, OHIO
Dings Magnetic Separator Co., 4740 West Electric Ave., Milwaukee 46, Wis.
Dodge Mfg. Corp., S. Union St., Mishawaka, Ind.
DORR-OLIVER INC., BARRY PLACE, STAMFORD, CONN.
DOW CHEMICAL CO., THE, MIDLAND, MICH.
Dravo Corp, Neville Island, Pittsburgh 25, Pa.
Drilling Accessory & Mfg. Co., Inc. P. O. Box 5768 2006 S. Industrial, Dallas, Texas
Drott Mfg. Corp., 3841 W. Wisconsin Ave., Milwaukee 8, Wis.
Drullard Co., Howard, 1026 Folsom St., San Francisco 3, Calif.
Ducon Co., 152 E. 2nd St., Mineola, N.Y.
Du-Jac Mfg. Corp., Box 856, Almeda Texas
Dunkin Blue Print & Supply Co., Box 1400, Grand Junction, Colo.
duPont de Nemours & Co., E. I. Chemicals Dept., duPont Bldg., Wilmington, Del.
DUPONT DE NEMOURS & CO., INC., EXPLOSIVES DIV., WILMINGTON 98, DELAWARE
DuPont de Nemours & Co., Inc., Fabrics Div., Newburgh, N.Y.
DUNHAM MFG. & SALES CO., GORDON S., 853 MISSION ST., SO. PASADENA, CALIF.
Duriron Co., Inc., The, P. O. Box 1019, Dayton 1, Ohio

E

Eagle Crusher Co., Galion, Ohio
Eagle Iron Works, 261 Holcomb Ave., Des Moines Iowa
Earle, Norton K., 1116½ N. Western Ave., Los Angeles 29, Calif.
Easton Car & Construction Co., Easton, Pa.
Eberline Inst. Div., Reynolds Elect. & Eng. Co., P.O. Box 279, 805 Early St., Santa Fe, New Mexico
Economy Fuse & Mfg. Co., Greenview Ave. at Diversey Pkwy., Chicago, Ill.
Edison, Inc., Thomas A., Edison Storage Battery Div., West Orange, N.J.
Edwards Co., E. H., P. O. Box 513 South San Francisco, Calif.
Edwards Co. Inc., Post Rd., Norwalk, Conn.
EIMCO CORP., 634 S. 4TH WEST ST., SALT LAKE CITY 10, UTAH
Electric Controller & Mfg. Co., 4514 Lee Road, Cleveland 28, Ohio
Electric Machinery Mfg. Co., 800 Central Ave., Minneapolis 13, Minn.
ELECTRIC STEEL FOUNDRY CO., 2141 N W 25TH AVE., PORTLAND 10, ORE.
ELECTRIC STORAGE BATTERY CO., EXIDE INDUSTRIAL DIVISION, 42 SOUTH 15TH STREET, PHILADELPHIA 2, PA.
ELECTRO TECHNICAL LABS DIV., MANDREL INDUSTRIES, 504 WAUGH DR., HOUSTON, TEXAS
Elektrokemisk A. S., 101 Park Ave., New York 17, N. Y.
ELLIOT, D. H., P.O. BOX 1007, CASPER, WYO.
Elreco Corp., 2900 Cormany Ave., Cincinnati 25, Ohio
El Paso Testing Laboratories, El Paso, Tex.
El-Tronics, Inc., Mayfield, Pa.
Engineers Syndicate, Ltd., 5011 Hollywood Blvd., Hollywood 27, Calif.
Ensign-Bickford Co., Hopmeadow St., Simsbury, Conn.
Enterprise Eng. & Mach Co., 18th & Florida St., S.F. 10, Calif.
Equipment Engineering Co., 9100 S. 150 E., Salt Lake City, Utah
EQUIPMENT ENGINEERS INC., 41 SUTTER ST., SAN FRANCISCO 4, CALIF.
Erie Pump & Engine Works, 165 Glenwood Ave., Medina, N.Y.
Eries Mfg. Co., 201 Magnet Drive, Erie, Pa.
Essex Wire Corp., 1601 Wall Street, Fort Wayne 6, Indiana
Esso Standard Oil Co., 15 West 51st St., New York 19, N. Y.
Esterline-Angus Co., Inc., P.O. Box 596, Indianapolis 6, Ind.
EUCLID DIVISION, SEE GENERAL MOTORS CORP.
Euclid Electric & Mfg. Co., 50 Edwards St., Madison, Ohio
Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing 58, N.Y.
Exolon Co., The, Tonawanda, N.Y.
Exploration Drilling Co., P.O. Box 1161, Bakersfield, Calif.

F

Fagertun Fabrikker, A/S, P.O. Box 22, Drammen, Norway
Failing Co., Geo. E., 424 E. Broadway, Enid, Oklahoma
Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.
Fairchild Aerial Surveys, Inc., 224 E. 11th St., Los Angeles, Calif.
Falk Corp., The, 3004 W. Canal St., Milwaukee 1, Wis.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Farris Flexible Valve Corp., 400 Commercial Ave., Palisades Park, N. J.
Farval Corp., The, 3249 E. 80th St., Cleveland, Ohio
Fate-Root-Heath Co., The, Plymouth Locomotive Wks. Div., Plymouth, Ohio
Federal Motor Truck Co., 6780 Federal Ave., Detroit 9, Mich.
FEDERAL PIPE & TANK CO., 6851 EAST MARGINAL WAY, SEATTLE 8, WASH.
Filter Fabrics, Inc., 1279 W. 3rd St., Cleveland 13, Ohio
Filtration Engineers Inc., 155 Oraton St., Newark 4, N. J.
Firestone Tire & Rubber Co., 1200 Firestone Pkwy., Akron 17, Ohio
Firth Sterling Inc., 3113 Forbes St., Pittsburgh 30, Pa.
Fischer & Porter Co., 215 Warminster Rd., Hatboro, Pa.
Fisher Contracting Co., P.O. Box 6306, Phoenix, Ariz.
Fisher Research Laboratory, Inc., 1961 University Ave., Palo Alto, Calif.
Fiske Brothers Refining Co., Lubriplate Div., 129 Lockwood St., Newark 5, N. J.
Flexible Steel Lacing Co., 4607 Lexington St., Chicago 44, Ill.
Flexible Tubing Corp., Guilford, Conn.
Flexible Valve Corp., 400 Commercial Ave., Palisades Park, N. J.
Fluidwick Co., 5319 E. Outer Dr., Detroit 34, Mich.
Food Machinery & Chem. Corp., John Bean Div., P.O. Box 145, San Jose 3, Calif.
Food Machinery & Chemical Corp., Peerless Pump Div., 301 West Avenue 26, Los Angeles, Calif.
Foster Engineering Co., 835 Lehigh Ave., Union, N. J.
Foster Wheeler Corp., 165 Broadway, New York 6, N. Y.
Four Wheel Drive Auto Co., 12th Street, Clintonville, Wis.
Foxboro Co., Foxboro, Mass.
Fraser & Chalmers Engr. Wks., Fraser Rd., Erith, Kent, England
Fruehauf Trailer Co., 10940 Harper Ave., Detroit 32, Mich.

G

GALIGHER CO., 545 WEST 8TH SOUTH ST., P.O. BOX 209, SALT LAKE CITY 10, UTAH
Galion Allsteel Body Co., S. Market St., Galion, Ohio
Gardner, E.D., 200 N. Wayne St., Arlington, Virginia
GARDNER-DENVER CO., FRONT ST., QUINCY, ILL.
Garlock Packing Co., Palmyra, New York
Gar Wood Industries, Inc., Wayne, Mich.
Gates Rubber Co., 999 S. Broadway, Denver, 17, Colo.
Gatke Corp., 228 N. LaSalle St., Chicago 1, Ill.
General American Transportation Corp., 135 S. LaSalle St., Chicago 90, Ill.
General Aniline & Film Corp., Ozalid Div., 101 Ansco Road, Johnson City, N.Y.
GENERAL CABLE CO., 420 LEXINGTON AVE., NEW YORK, N.Y.
General Detroit Corp., 110 Mt. Elliott, Detroit, Mich.
General Dynamics Corp., Electro Dynamic Div., Avenue A, Bayonne, New Jersey
General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, New York
General Electric Co., Plainville, Conn.
General Electric Co., Carboloy Dept., Box 237, Roosevelt Park Place, Detroit 32, Mich.
General Electric Co., Construction Materials Division, 1285 Boston Ave., Bridgeport 2, Conn.
General Electric Co., International 570 Lexington Ave., N.Y.
General Electric Co., Lamp Div., Nela Park, Cleveland 12, Ohio
General Electric Co. Ltd., The Fraser & Chalmers Eng. Works, Erith, Kent, England
General Machinery Co., 3500 Riverside Ave., Spokane, Wash.
General Metals Corp., Enterprise Engine & Machinery Co., 18th & Florida Streets, San Francisco 10, Calif.
General Mills, Inc., Chemical Div., Kankakee, Ill.
General Mills, Inc., Special Commodities Div. 400 Second Ave. South, Minneapolis 1, Minn.
General Motors Corp., Allison Div., P.O. Box 894, Indianapolis, Ind.
General Motors Corp., Delco Products Div., 329 E. First St., Dayton, Ohio
General Motors Corp., Detroit Diesel Engine Div., 13400 W. Otter Drive, Detroit 28, Mich.
General Motors Corp., Electro-Motive Div., La Grange, Ill.
GENERAL MOTORS CORP., EUCLID DIV., 1361 CHARDON RD., CLEVELAND 17, OHIO
General Motors Corp., GMC Truck & Coach Div., 660 S. Blvd., E. Pontiac 11, Mich.
General Motors Corp., 269 N. Main St., New Departure Div., Bristol, Conn.
GENERAL MOTORS OVERSEAS OPERATION, 1775 BROADWAY, NEW YORK 19, N. Y.
General Petroleum Corp., 612 S. Flower St., Los Angeles, Calif.
General Refractories Co., 1520 Locust St., Philadelphia 2, Pa.
General Tire & Rubber Co., Akron 1, Ohio
Geo-Engr., 304 Main St., Grand Junction, Colo.
Geo-Optic Co., Inc., 170 Broadway, New York 38, N.Y.
Geophysical Services, Inc., 5900 Lemmon St., Dallas 9, Texas
Geophysical Specialties Co., 4206 Longfellow Ave., Minneapolis 7, Minn.
Geoprofessional Services, Inc., 65 E. 4th St. S., Salt Lake City 11, Utah
Georgia Iron Works Co., 605-12th Street, Augusta, Ga.
GETMAN BROS. MFG. DIV., INC., DUNKLEY AVE., SOUTH HAVEN, MICH.
Gibson, W. W., 1015 Fruitvale Ave., Oakland 1, Calif.
Gilbreath Chemical Co., 383 Brannan St., San Francisco, Calif.
GODOY & CO., INC., E. A., CUNARD BLDG., 25 BROADWAY, NEW YORK 4, N.Y.
Goldak Co., 1544 W. Glenoaks Blvd., Glendale 1, Calif.
GOODALL BROS., BOX 537, 46 S. MAIN ST., HELENA, MONTANA
GOODALL RUBBER CO., 430 WHITEHEAD ROAD, TRENTON, N.J.
GOODMAN MFG. CO., HALSTED ST. & 48TH PL., CHICAGO 9, ILL.
Goodrich Co., B. F., Industrial Prod. Div., 500 S. Main St., Akron, Ohio
Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, Ohio
GOULD & CO., GORDON L., 58 SUTTER ST., SAN FRANCISCO 4, CALIF.
Gould-National Batteries, Inc., Trenton 7, New Jersey
Granby Cons. Mining Smelting & Power Co., Ltd. Copper Mt. British Columbia, Canada
GRAYBAR ELECTRIC CO., INC., 420 LEXINGTON AVE., NEW YORK 17, N.Y.
GREENSBURG MACHINE CO., STANTON ST., GREENSBURG, PA.
Gregg Co., Ltd., The, 19 Rector St., New York 6, N.Y.
Grinnell Co., Inc., 260 West Exchange St., Providence, R. I.
GRIPHOIST INC., 424 BRYANT ST., S.F. 7, CALIF.
Gruendler Crusher & Pulverizer Co., 2917 N. Market St., St. Louis, Mo.
Gulf Oil Corp.—Gulf Refining Co., 1822 Gulf Bldg., P.O. Box 1166, Pittsburgh 30, Pa.
Gundlach Machine Co., Div., T. J., J. M. J. Industries, Inc., 226 Centerville Ave., Belleville, Ill.
Gurley, W. & L. E., 521 Fulton St., Troy, N.Y.
Guston-Bacon Mfg. Co., 210 W. 10th St., Kansas City, Mo.

H

Hack Engineering Co., 124 Wazee Market, Denver, Colo.
Hains Mfg. Co., Inc., Geo., 350 5th Ave., N.Y. 1, N.Y.
HALL-SCOTT MOTORS, INC., 2350-7TH ST., BERKELEY, CALIF.
Hammond Bag & Paper Co., Wellsburg, W.Va.
HANKS, INC., ABBOT A., 624 SACRAMENTO ST., SAN FRANCISCO 11, CALIF.
Harbison-Walker Refractories Co., 1800 Farmers Bank Bldg., Pittsburgh 22, Pa.
HARDINGE CO., INC., 240 ARCH ST., YORK, PA.
HARNISCHFEGER CORP., 4400 W. NATIONAL AVE., MILWAUKEE 46, WIS.
HARNISCHFEGER EXPORT CORP., SEE HARNISCHFEGER CORP.
Havlick, J. L., 112 S. Cedar St., Spokane, Wash.
HAWLEY & HAWLEY, BOX 1060, DOUGLAS, ARIZ.
HAWTHORNE, HERB J. INC., P.O. BOX 7366, HOUSTON 8, TEXAS

Haynes Stellite Co., 725 S. Lindsay St., Kokomo, Ind.
Hazard Insulated Wire Wks., Okonite Co., Passaic, N.J.
Hazen, H. L., H. L. Hazen, Inc., Farmers Union Bldg., Denver, Colo.
Hasemag of Germany, Loddenheide 31, Munster (Westfallen), Germany
Hasemag of Germany, 122 E. 42nd St., New York 17, N. Y.
Heil Co., 3000 W. Montana St., Milwaukee 1, Wis.
Hendrick Mfg., Co., Carbondale, Pa.
Henaley Equip. Co., 860 Peralta Ave., San Leandro, Calif.
Hercules Motors Corp., 101 11th St. S.E., Canton 2, Ohio
Hercules Powder Co., 900 Market St., Wilmington, Del.
Hercules Steel Products Co., Sherman St., Gallon, Ohio
Hevi Duty Electric Co., 4212 W. Highland Blvd., Milwaukee 1, Wis.
HEWITT-ROBINS INC., 666 GLENBROOK RD., STAMFORD, CONN.
Hewitt-Robins inc., Hewitt Rubber Div., 340 Kensington Ave., Buffalo 5, N. Y.
Heyl & Patterson, Inc., 55 Fort Pitt Blvd., Pittsburgh 22, Pa.
Hillman Co., C. Kirk, 3201 First Ave. South, Seattle 4, Wash.
Hirsch Bros. Machy. Co., P.O. Box 220, El Paso, Tex.
HITCHCOCK MFG. CO., LEO, 12015 WICKS ST., SUN VALLEY, CALIF.
Hobart Bros. Co., Hobart Sq., Troy, Ohio
Hockensmith Corp., The Penn, Pennsylvania
Hoffman Bros. Drilling Co., 120 E. Mahoning St., Punxsutawney, Pa.
Holman Bros. (Canada) Ltd., Kent Ave., Kitchener, Ontario, Canada
Holman Bros., Ltd., Camborne, Cornwall, England
Holtzer-Cabot—see National Pneumatic Co., Inc.
Homelite Div., Textron, Inc., Riverdale Ave., Port Chester, New York
Homer Mfg. Co., 142 East Pearl St., Lima, Ohio
Hose Accessories Co., Le-Hi Div. 17th & Lehigh Ave., Philadelphia 32, Pa.
Hose Accessories Co., Champ Industries Div., Lehigh Ave. & 17th St., Phila. 32, Pa.
HOSSFELD MFG. CO., 460-462 WEST THIRD ST., WINONA, MINN.
Hough Co., The Frank G., 859 Sunnyside Ave., Libertyville, Ill.
Houghton & Co., E. F., 303 W. Lehigh Ave., Philadelphia 33, Pa.
Houston Tool Co., Santa Susana, Calif.
Howe Scale Co., Inc., Rutland, Vermont
Howell Electric Motors Co., 409 N. Roosevelt St., Howell Mich.
HUBER WARCO CO., 202 N. GREENWOOD ST., MARION, OHIO
HUGHES TOOL CO., P.O. BOX 2539 HOUSTON 1, TEXAS
Hulin, Carlton D. 7 Ardilla Rd., Orinda, Calif.
Humboldt, Klockner-Humboldt-Deutz A. G., Cologne, Kalk, Western Germany
HUMPHREYS INVESTMENT CO., ENGINEERING DIV., 910 FIRST NATIONAL BANK BLDG., DENVER 2, COLO.
Hunting Associates, Ltd., 1450 O'Connor Dr., Toronto 16, Ontario, Canada
Hycon Aerial Surveys, Inc., 1020 S. Arroyo Parkway, Pasadena, Calif.
Hydraulic Supply Mfg. Co., 7500 8th Ave. So., Seattle, Wash.
Hyster Co., 2902-80 N.E. Clackamas St., Portland 8, Oregon

I

Ideal Electric & Mfg. Co., Mansfield, Ohio
Ideal Industries, Inc., 3624 Park Ave., Byesmore Ill.
Illinois Powder Mfg. Co. 506 Olive St. St. Louis, Mo.
Imperial Oil & Grease Co., 6505 Wilshire Blvd., Los Angeles 48, Calif.
Industrial Air Products Co., 3200 N.W. Yeon Ave., Portland 10, Ore.
Industrial Coupler Co., P.O. Box 1751, E. 4218 Boone Ave., Spokane, Wash.
Industrial Physics & Electronics Co., 470 S. 10th E., Salt Lake City 2, Utah
INGERSOLL, GUY E., 5505 TIMBERWOLF DRIVE, EL PASO, TEXAS
INGERSOLL-RAND CO., 11 BROADWAY, NEW YORK 4, N.Y.
International Combustion Ltd., 19 Woburn Place, London W.C. 1, England
International Engr., Inc., 1145 Bollander Ave., Dayton 1, Ohio
International General Electric Co., 570 Lexington Ave., New York 21, N.Y.
International Geophysics, Inc., 1063 Gayley Ave., Los Angeles, Cal.
Internat'l Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.
INTERNAT'L HARVESTER EXPORT CO., 180 N. MICHIGAN AVE., CHICAGO 1, ILL.
International Minerals & Metals Corp., 11 Broadway, New York 4, N.Y.—see Ore Buyers Guide, pg. 139
INTERNAT'L SMELTING & REFINING CO., 818 KEARNS BLDG., SALT LAKE CITY, UTAH
Iowa Mfg. Co., Cedar Rapids, Iowa
Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland 11, Ohio
Irwin Foundry & Mine Car Co., P.O. Box 311, Irwin, Pa.
Isbell Construction Co., P. O. Box 2251, Reno, Nevada
I-T-E Circuit Breaker Co., 19th & Hamilton Sts., Philadelphia 30, Pa.

J

Jacuzzi Bros., Inc., 5227 Jacuzzi Ave., Richmond, Calif.
Jaeger Machine Co., 667 Dublin Ave., Columbus, Ohio
James Equipment, Inc., 712 Rockefeller St., Elizabeth, N.J.
JEFFREY MFG. CO., 861 N. 4TH ST., COLUMBUS 16, OHIO
Jet-Lube, Inc., 7362 West Beverly Blvd., Los Angeles 36, Calif.
Jet-Lube, Inc., 3039 N. California St., Burbank, Calif.
JOHNS-MANVILLE SALES CORP., 22 EAST 40TH ST., NEW YORK 16, N. Y.
Johnson, Consultant, Herbert B., 804 Franklin St., Clearwater, Fla.
Johnson Block Co., Box 1432, 501 S. Rockford St., Tulsa, Okla.
JOHNSON, HERBERT BANKS, 804 FRANKLIN ST., CLEARWATER, FLA.
Johnson Loading Supplies, G. R., 5025 Butterworth Rd., Mercer Is., Wash.
Johnson March Corp., 1724 Chestnut St., Philadelphia 3, Pa.
Johnston Pump Co., 3272 E. Foothill, Pasadena, Calif.
JONES, PHILIP L., 405 MINERS BANK BLDG., JOPLIN, MO.
Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.
Joost Mfg. Co., 742 Bancroft Way, Berkeley, Calif.
JOY MFG. CO., HENRY W. OLIVER BLDG., PITTSBURGH 22, PA.
Junction Bit & Tool Co., P.O. Box 1951, Grand Junction, Colo.
Justrite Mfg. Co., 2061 N. Southport, Chicago 14, Ill.

K

Kaiser Aluminum & Chem. Corp., 1924 Broadway, Oakland 12, Calif.
Kaiser Steel Corp., 1924 Broadway, Oakland, Calif.
Ka-Mo Tools, Inc., 1845 So. 55 Ave., Cicero 50, Ill.
Kansas City Hay Press Co., 801 Woodsweather Road, Kansas City, Mo.
KEEGEL, C. P., 1721 S. 14TH ST., LAS VEGAS, NEVADA
Keeney, Paul E., Co., 1125 S. E. Grand Ave., Portland 14, Ore.
KENNAMETAL INC., MININGTOOL DIV., BEDFORD, PA.
KENNEDY-VAN SAUN MFG. & ENG. CORP., TWO PARK AVE., NEW YORK 16, N.Y.
KENWORTH MOTOR TRUCK CORP., 8801 E. MARGINAL WAY, P.O. BOX 3505, SEATTLE, WASH.
Kern Instruments, Inc., 120 Grand St., White Plains, N.Y.
Keuffel & Esser Co., 300 Adams St., Hoboken, N.J.
Keystone Lubricating Co., 21st & Lippincott Sts., Philadelphia 32, Pa.
Kidde, Walter & Co., Inc., 656 Main St., Belleville 9, N.J.
King Powder Co., The, P. O. Box 974, Cincinnati, Ohio
Klockner-Humboldt-Deutz Ag., Koln, Germany
Knapp & Bates, Ltd., 52 Kings Road, Richmond, Surrey, England
Koebel Diamond Tool Co., 9456 Grinnell Ave., Detroit 13 Mich.
KOEHRING CO., 3026 WEST CONCORDIA AVE., MILWAUKEE 16, WIS.
Koehring Southern Co., Manufactures Rd., Chattanooga 1, Tenn.
Kohler Co., Kohler, Wis.
Koppers Co., Wood Pres. Div., 700 Koppers Bldg., Pittsburgh 19, Pa.
Koopers Co., Inc., Wolman Dept., 789 Koopers Bldg., Pittsburg, Pa.
Korb-Pettit Wire Fabrics & Iron Works, Inc., Subsid. of Hewitt-Robins Inc., 1526 N. Mascher St., Philadelphia 22, Pa.
Krebs, Kellogg, 564 Market St., San Francisco 4, Calif.
Krogh Pump & Equipment Co., 515 Harrison St., San Francisco, Calif.
Kulhman Electric Co., 1000 26th St., Bay City, Mich.

L

LaBour Co., 1607 Sterling Ave., Elkhart, Ind.
LAKE SHORE INC., LAKE SHORE ENG. DIV., BOX 911 IRON MTN., MICH.
Landis Steel Co., Box 248, 116 West A St., Picher, Okla.
LaRoe Instruments, Inc., 1709 B. Rockville Pike, Rockville, Maryland
Laughlin Co., Thomas, 143 Fore St., Portland 6, Maine
Laylander, Philip A., Box 4395, Tucson, Ariz.
Lead Lined Iron Pipe Co., 33 Broadway, Wakefield, Mass.
LECTROMELT FURNACE CO., PITTSBURGH, PA.
LEDEEN MFG. CO., 3338 N. GILMAN RD., EL MONTE, CALIF.
LEDOUX & CO., 359 ALFRED AVE., TEANECK, N.J.
Leeds & Northrup Co., 4970 Stenton Ave., Phila. 44, Pa.
Lee Rubber & Tire Corp., Republic Rubber Div., 1410 Albert St., Youngstown, Ohio
Lefax, Ninth & Sansom Sts., Phila. 7, Pa.
Lehigh Safety Shoe Co., First & Minor Sts., Emmaus, Pa.
Leonard Electric Mfg. Co., 3907 Perkins Ave., Cleveland 14, Ohio
Lerlah Supply Co., P. O. Box 810, Hibbing, Minn.
Lerch Bros. Inc., P. O. Box 810, Hibbing, Minn.
Le Roi Div., Westinghouse Airbrake Co., 3716 W. Wisconsin Ave., Milwaukee, Wis.
Leschen Wire Rope Div., H. K. Porter Co., 2727 Hamilton Ave., St. Louis 12, Mo.
LETOURNEAU-WESTINGHOUSE CO., 2301 N. ADAMS ST., PEORIA, ILL.
Lima Electric Motor Co., Findlay Road, Lima, Ohio
Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio
Linde Air Products Co., 30 E. 42nd St., New York 17, N.Y.
LINK-BELT CO., PRUDENTIAL PLAZA, DEPT. WMD-57, CHICAGO, ILL.
Link-Belt Speeder Corp., 1201 Sixth St., S.W., Cedar Rapids, Iowa
Linta, Mark, 275 Middlefield Dr., San Francisco 27, Calif.
Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14 Wis.
Lister-Blackstone, Inc., 42-32 21st St., Long Island City 1, N. Y.
LIVINGSTON & WILSON EXPLORATION & DRILLING CO., LONGMONT, COLO.
LOGAN ENGR. CO., 4901 LAWRENCE AVE., CHICAGO 30, ILL.
LONGYEAR CO., E. J., 1700 FOSHAY TOWER, MINNEAPOLIS 2, MINN.
Los Angeles Scientific Instrument Co., 2451 Riverside Drive, Los Angeles 39, Calif.
Lowell Insulated Wire Corp., P.O. Box 571, Pawtucket, R.I.
Ludlow-Saylor Wire Cloth Co., 634 South Newstead Ave., St. Louis 10, Mo.
Lufkin Rule Co., Saginaw, Mich.
Lug-All Co., 355 E. Lancaster Haverford, Pa.
Lundberg Exploration, Ltd., 96 Eglinton Ave. E., Toronto 12, Ontario, Canada
Lunkenheimer Co., Beekman St. & Waverly Ave Cincinnati 14 Ohio
Lynn Engr. Co., Russ Building, San Francisco 4, Calif.

M

MRS Mfg. Co., Jackson, Miss.
MACAFEE & CO., 3105 WILSHIRE BLVD., LOS ANGELES 5, CALIF.
MacBeth Instrument Corp., P.O. Box 950, Newburgh, N.Y.
MACE CO., THE, 2743 BLAKE STS., DENVER 5, COLO.
Mack, Peter, Box 808, Denver 2, Colo.
MACK TRUCKS, INC., EMPIRE STATE BLDG., NEW YORK 1, N.Y.
MacMillan Petroleum Corp., 530 W. Sixth St., Los Angeles 14, Calif.
MacWhyte Co., 2998 14th Ave., Kenosha, Wis.
Maddox Foundry & Machinery Works, Archer, Fla.
MAGMA COPPER CO., SUPERIOR, ARIZONA
Magnetic Engineering & Mfg Co., 851 Van Houten Ave., Clifton, N.J.
Magor Car Corp., 50 Church St., New York 7, N.Y.
MAHOGANY IMPORTING CO., 725 S. SPRING ST., LOS ANGELES 14, CALIF.
Majac, Inc., 23rd St. & P.R.R., Sharpsburg 15, Pa.
MANCHA STORAGE BATTERY LOCOMOTIVE DIV., GOODMAN MFG. CO., HALSTEAD & 48TH PL., CHICAGO 9, ILL.
Manchester Bit Corp., 11 Broadway, N.Y. 4, N.Y.
Manitowoc Engineering Corp., South 16th St. Manitowoc, Wis.
MARION POWER SHOVEL CO., 617 W. CENTER ST., MARION, OHIO
Markley Dust Control System, Inc., 80 Snyder Road, Ramsey, N.J.
Marlin-Rockwell Corp., 402 Chandler St., Jamestown, N.Y.

Marlow Pumps Div., Bell & Gossett Co., Box 200, Midland Park, N.J.
Marmon-Herrington Co., Inc., 1511 W. Washington St., Indianapolis 7, Ind.
MARTINDALE ELECTRIC CO., 1333 HIRD AVE., CLEVELAND 7, OHIO
Master Electric Co., 126 Davis Ave., Dayton 1, Ohio
Matheson Co., Inc., Richard St. & Manhattan Rd., Joliet, Ill.
Matheson Co., Inc., 327 Paterson Plank Rd., P.O. Box 85, East Rutherford, N.J.
Mayhew Supply Co., 4700 Seyene Rd., Dallas, Texas
MAYO TUNNEL & MINE EQUIP., BOX 1413, LANCASTER, PA.
McCauley Industrial Corp., 1840 Howell Ave., Dayton, Ohio
McClintock Co., R. S., W. 418-2nd Ave., Spokane, Wash.
McDonald, T. J., 14408 St. Marys, Detroit 27, Mich.
McDowell Co., Inc., The, 3203 W. 71st St., Cleveland 2, Ohio
McKenzie & Whittle Const., P.O. Box 243, Carlsbad, New Mexico
McLanahan & Stone Corp., Hollidaysburg, Pa.
McNally Pittsburgh Mfg. Corp., Drawer D, Pittsburgh, Kansas
MEISSNER ENGR. INC., JOHN P., 308 W. WASHINGTON, CHICAGO 6, ILL.
Menardi & Co., 1222 E. Grand Ave., El Segundo, Calif.
Menlo Research Lab., Box 522, Menlo Park, Calif.
Merck & Co., Lincoln Ave., Rahway, N.J.
MERRICK SCALE MFG. CO., 180 AUTUM ST., PASSAIC, N.J.
Metal Carbides Corp., 6001 Southern Blvd., Youngstown, Ohio
Metron Instrument Co., 432 Lincoln St., Denver, Colo.
Mexico Refractories Co., Mexico, Mo.
Michigan Pipe Co., 6581 Mill St., Gagetown, Bay, Mich.
Michigan Tool Co., Manistee Iron Works, Manistee Mich.
Miehle-Goss-Dexter, Inc., Star-Kimble Motor Div., 200 Bloomfield Ave., Bloomfield, N.J.
Micro Switch, div. of Minneapolis-Honeywell Regulator Co., Chicago & Spring Sts., Freeport, Ill.
Mill & Mine Supply, Inc., 625 Lander St., Seattle 4, Wash.
Miller Machinery Co., Box 1496, Missoula, Montana
Mills Iron Works, Inc., 929 North Main St., Los Angeles 12, Calif.
Minerais et Metaux, 55 Rue D'Amsterdam, Paris 8, France
Minerals Engineering Co., 417 S. Hill St., Los Angeles 13, Calif.
Minerals Engr. Co., P. O. Box 1951, 801-4th Ave., Grand Junction, Colorado
Minerals Exploration Research Corp., 2120 Ford St., Golden, Colo.
Minerals Laboratory, 1303 Grant St., Silver City, New Mexico
Minerec Corp., 120 Broadway, New York, N.Y
MINE SAFETY APPLIANCES CO., 201 N. BRADDOCK AVE., PITTSBURGH 8, PA.
MINE & SMELTER SUPPLY CO., 1422-17TH ST., DENVER, COLO.
Miners Foundry & Mfg. Co., 200 Spring St., Nevada City, Calif.
Minneapolis-Honeywell, Helland Div., 130 E. 5th Ave., Denver 3, Colo.
Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Avenues, Philadelphia 44, Pa.
Minneapolis-Moline Co., P. O. Box 1050, Minneapolis 1, Minn.
Minnesota Mng. & Mfg. Co., Irvington Varnish & Insulator Div., 6 Argyle Terrace, Irvington 11, N.J.
Mitchell Mfg. Co., 101 Sherman Ave., New York 34, N.Y.
Mixermobile Mfg. Inc., 8027 N.E. Killingsworth, Portland 20, Ore.
MOAB DRILLING CO., 62 E. CENTER ST., BOX 387, MOAB, UTAH
Mobile Drilling, Inc., 960 North Pennsylvania St., Indianapolis 4, Ind.
Mona Industries Inc., 65-75 E. 23rd St., P.O. Box 1786, Paterson 17, N.J.
Monarch Equipment Co., 6858 Lankershim Blvd., N. Hollywood, Calif.
Monsanto Chemical Co., 1700 S. Second St., St. Louis 4, Mo.
MORRIS MACHINE WORKS, BALDWINSVILLE, N.Y.
Morse Bros. Machinery Co., 2900 Brighton Blvd., Denver, Colo.
Morse Chain Co., Ithica, N.Y.
Mosebach Electric & Supply Co., 1115 Arlington Ave., Pittsburgh 8, Pa.
Motor Generator Corp., W. Water St. Troy, Ohio
Motorola Communication & Electronics, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill.
Mott & Sons, Inc., B. H., Grand Junction, Colo.
Mott Core Drilling Co., Mott Bldg., Box 2076, Huntington, W. Va.
Mt. Sopris Inst. Corp., 1320 Pearl St., Boulder, Colo.
MURPHY, P. M., CONSULTING GEOL., 1201 MARYLAND PARKWAY, LAS VEGAS, NEV.

N

NAGLE PUMPS, INC., 1250 CENTER AVE., CHICAGO HEIGHTS, HARVEY, ILL.
Napco Industries Inc., 834 N. 8th St., Minneapolis 11, Minn.
National Airoil Burner Co., 1284 E. Sedgley Ave., Philadelphia 34, Pa.
National Carbon Co., 60 E. 42nd St., N.Y. 17, N.Y.
National First Aid Supply Co., 28 W. 15th St., N.Y. 11, N.Y.
National Filter Media Corp., 1717 Dixwell Ave., Hamden, Conn.
National Fuse & Powder Co., 3801 Delgany St., Denver 5, Colorado
NATIONAL IRON CO., 50TH AVE. & RAMSEY ST., DULUTH 7, MINN.
NATIONAL MALLEABLE & STEEL CASTINGS CO., 19600 QUINCY AVE., CLEVELAND 6, OHIO
NATIONAL TANK & PIPE CO., 2301 N. COLUMBIA BLVD., PORTLAND 17, ORE.
National Supply Co., 2 Gateway Center, Pittsburgh 22, Pa.
NATIONAL TANK & PIPE CO., 2301 N. COLUMBIA BLVD., PORTLAND 17, ORE.
NAYLOR PIPE CO., 1242 E. 92ND ST., CHICAGO 19, ILL.
New Jersey Meter Co., 120 Waynewood Park, Plainfield, New Jersey
New York Air Brake Co., The, Aurora Pump Div., 86 Loucks St., Aurora, Ill.
NEW YORK—ARIZONA DEVELOPMENT CORP., 614 MAYER-HEARD BLDG., PHOENIX, ARIZ.
Newport Industries, Co., 230 Park Ave., N.Y. 17, N.Y.
Nice Ball Bearing Co., 30th & Hunting Park Ave., Philadelphia 40, Pa.
Nichols Engineering & Research Corp., 70 Pine St., New York 5, N.Y.
Nolan Co., Bowerston, Ohio
NORDBERG MFG. CO., 3073 S. CHASE AVE., MILWAUKEE 1, WIS.
North American Refractories Co., 1012 Nat'l. City-E. 6th St. Bldg., Cleveland 14, Ohio
NORTHERN BLOWER CO., 6429 BARBERTON AVE, CLEVELAND 2, OHIO
Northwest Engr. Co., 135 S. LaSalle St., Chicago 3, Ill.
Norton Co., 1 New Bond St., Worcester 6, Mass.
Norwood Controls Unit, 934 Washington St., Norwood, Mass.
Nuclear-Chicago Corp., 223 W. Erie St., Chicago 10, Ill.
Nucleonic Corp. of America, 196 Degraw St., Brooklyn 31, N.Y.

O

O'DONNELL & SCHMIDT, 165 BROADWAY, NEW YORK 6, N.Y.
Ogden Iron Works Co., 185-23rd St., Box 147 Ogden, Utah
Ohio Brass Co., 380 North Main St., Mansfield, Ohio
Ohio Carbon Co., 12508 Berea Rd., Cleveland 11, Ohio
Ohio Electric Mfg. Co., 5900 Maurice Ave., Cleveland 27, Ohio
Ohio Gear Co., 1333 E. 179th St., Cleveland 10, Ohio
Ohio Hoist & Mfg. Co., 13111 Shaker Sq., Dept. M.W. Cleveland 20, Ohio
Ohio Locomotive Crane Co., Bucyrus, Ohio
OKONITE CO., HAZARD INSULATED WIRE WORKS DIV., 320 PASSAIC ST., N.J.
Olin Mathieson Chem. Corp., Explosives Div., East Alton, Ill.
OLIVER CORP., 400 W. MADISON ST., CHICAGO 6, ILL.
Oliver Corp., A. B. Farquaar Div., 142 N. Duke St., York, Pa.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh 3, Pa.
Onan Sons, Inc., D. W., 2515 University Ave., S.E., Minneapolis 14, Minn.
ORE & CHEMICAL CO., 80 BROAD ST., NEW YORK, N.Y.
ORE RESEARCH & LABORATORIES, 1511 LEVEE ST., DALLAS, TEXAS
Ore Trucks, Inc., 320 South Grand St., St. Louis, Mo.
Osborne Lab. Inc., Raymond G., 235 W. 27th, Los Angeles 15, Calif.
Osmose Wood Preserving Co. of America Inc., 980 Ellicott St., Buffalo 9, N.Y.
Overstrom & Sons, 2218 W. Mission Rd., Alhambra, Calif.
Owen Bucket Co., The 6001 Breakwater Ave., Cleveland 2, Ohio
Oxy-Catalyst, Inc., P. O. Box 151, Wayne, Pa.

P

Pacific Car & Foundry Co., 4th & Factory, Renton, Wash.
Pacific Coast Engr Co., Oak & Cement Sts., P.O. Drawer "E," Alameda 6, Calif.
PACIFIC FOUNDRY CO., LTD., 3100 19TH ST., SAN FRANCISCO 10, CALIF.
Pacific Gear & Tool Works, Inc., 1085 Folsom St., San Francisco 3, Calif.
Pacific Pipe Co., 401 Folsom St., San Francisco, Calif.
Pacific Wire Rope Co., 1840 E. 15th St., Los Angeles 21, Calif.
Pacific Wood Tank Corp., 461 Market St., San Francisco 5, Calif.
Pack Mfg. Co., P. O. Box 506, Logan, Utah
Page Engineering Co., Clearing Post Office, Chicago 38, Ill.
Paranite Wire & Cable, Div., Essex Wire Corp., 1601 Wall St., Ft. Wayne, Ind.
Parker Safety Equip. Co., 755 Lyons Ave., Irvington 11, N.J.
Peale, Rogers, 315 Montgomery St., San Francisco, Calif.
Peerless Pump Div., 301 W. Ave. 26, Los Angeles 31, Calif.
Pence & Co., Inc., Earl H., 2150 Washington Ave., San Leandro, Calif.
Pendleton Woolen Mills, P.O. Box 275, Washougal, Wash.
Penn Instrument Div., Burgess Manning Co., 4110 Haverford Ave., Philadelphia, Pa.
PENNSYLVANIA CRUSHER CO., BATH IRON WORKS CORP., 323 S. MATLACK ST., WEST CHESTER, PA.
Pennsylvania Drilling Co., 1205 Chartiers Ave., Pittsburgh 20, Pa.
Pennsylvania Salt Mfg. Co., 3 Penn. Center Plaza, Phila., 2, Pa.
Permo Exploration Co., Box 401 Nye, Montana
Permutit Co., The, 330 W. 42nd St., New York, N.Y.
Peterson Filters & Engr. Co., 127 Social Hall Ave., Salt Lake City, Utah
Pettibone Mulliken Corp., 4710 W. Division St., Chicago 51, Ill.
Phelps Dodge Refining Corp., 40 Wall St., New York 5, N.Y.
Phelps Dodge Copper Prod. Corp., 300 Park Ave., New York, N.Y.
Philadelphia Gear Works, Inc., G-St. below Erie Ave. & G. St., Philadelphia 34, Pa.
Philadelphia Quartz Co., 1140 Public Ledger Bldg., Philadelphia 6, Pa.
Philip Carey Mfg. Co., Wayne Ave. at Cooper, Cincinnati, Ohio
Pick Laboratories, P.O. Box 67, Saratoga, Calif.
Philips Electronics, Inc., Instruments Div., 750 South Fulton Ave., Mt. Vernon, N.Y.
Pierce, Roger V., 808 Newhouse Bldg., Salt Lake City 4, Utah
Pinger, Allen W., 1419 Circle Way, Salt Lake City, Utah
Pioneer Engineering Div., Poor & Co., Inc., 3200 Como Ave., Minneapolis, Minn.
Plastic Tamping Stick Sales, P. O. Box 49, R.R. 3, Iron River, Michigan
PLYMOUTH LOCOMOTIVE WORKS, PLYMOUTH, OHIO
Pollock Co., Wm. B., 101 Andrews Ave., Youngstown, Ohio
Porter, Inc., H. K., 74 Foley St., Sommerville 43, Mass.
Porter Co., Inc., H. K., Leschen Wire Rope Div., 2727 Hamilton Ave. St. Louis, Mo.
Porter Co., Inc., H. K., Quaker Rubber Div., Tacony & Comly Streets, Philadelphia, Pa.
Porter Co., Inc., H. K., W-S Fittings Div., 109 Aldene Road, P.O. Box 95, Roselle, N.J.
Portland Woolen Mills, Inc., P.O. Box 2620, Portland 3, Ore.
Porto Tool Co., 3103 Santa Monica Blvd., Santa Monica, Calif.
Post Co., Frederick, 135 E. Ohio, Chicago, Ill.
Powermite Drill & Tool Co., 1610¼ N. Highland, Box 691, Hollywood, Calif.
Precision Radiation Instruments Inc., 4223 W. Jefferson Blvd., Los Angeles 16, Calif.
Price, Franklin L. C., 1165 Northern Life Tower, Seattle 1, Wash.
Princeton Gripholst, Inc., 32 George St., Boston 19, Mass.
PRODUCTIVE EQUIPMENT CORP., 2926 W. LAKE ST., CHICAGO 12, ILL.
Pulmosan Safety Equip. Corp., 644 Pacific St., Brooklyn 17, N.Y.
Pulva Corp., 550 High St., Perth Amboy, N.J.
Pumps, Inc., 323 W. 10th St., Indianapolis 7, Indiana
Punch-Lok Co., 321 N. Justine St., Chicago 7, Ill.
Pyrene C-O-Two Div., Fyr-Fyter Co., The, P.O. Box 750, Newark 1, N.J.
Pyrometer Instrument Co., Inc., 92 Portland Ave., Bergenfield, N.J.

Q

Quaker Pioneer Rubber Mills, 520 Fourth St., San Francisco, Calif.
Quaker Rubber Co., Philadelphia 24, Pa.
Quick-Way Truck Shovel Co., 2401 E. 40th Ave., Box 1800, Denver, Colo.

R

Radiac Co., Inc., 489 5th Ave., New York 17, N.Y.
Ramps Ajax Div., American Brake Shoe Co., 332 S. Michigan Ave., Chicago 4, Ill.
Rankin Mfg. Co., 616 S. Marengo Ave., Alhambra, Calif.
Rawson Electrical Instrument Co., 110 Potter St., Cambridge 42, Mass.
Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N.J.
Ray Drilling Co., Inc., 343 S. State, Salt Lake City, Utah
Ray-O-Vac Co., 212 E. Washington Ave., Madison 10, Wis.
Ray-O-Vac Co., Willson Products Div., 2nd & Washington Sts., Reading, Pa.
Ready Power Co., 11231 Freud Ave., Detroit 14, Mich.
Reeves Pulley Co., 1225-7th St., Columbus, Ind.
Reich Bros. Mfg. Co., 1439 Ash St., Terre Haute, Ind.
Reilly Tar & Chemical Corp., 1615 Merchants Bank Building, Indianapolis 4, Ind.
Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio
Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport 2, Conn.
Republic Rubber Div., Lee Rubber & Tire Corp., Albert St., Youngstown, Ohio
Republic Steel Corp., Republic Bldg., Cleveland 1, Ohio
Republic Steel Corp., Bolt & Chain Div., 1970 Carter Rd., Cleveland, Ohio
Republic Steel Corp., Truscon Steel Div., Albert St., Youngstown 1, Ohio
Research Cottrell, Inc., P.O. Box 750, Bound Brook, N.J.
Research Inc., 1511 Lence St., P.O. Box 10243, Dallas Texas
Resisto-Loy Co., Inc., 1251 Phillips Ave., S.W., Grand Rapids 7, Mich.
Revere Copper & Brass Inc., 230 Park Ave., New York 17, N.Y.
Revere Electric Mfg. Co., 6009 Broadway, Chicago 40, Ill.
Rhoads & Son, J. E., 2100 W. 11th St., Wilmington 99, Del.
RIBLET TRAMWAY CO., N. 1231 WASHINGTON ST., SPOKANE, WASH.
Rice Pump & Mach. Co., Belgium, Wisc.
Richardson Scale Co., 668 Van Houten Ave., Clifton, N.J.
Rick Helicopter, San Francisco International Airport, San Francisco, Calif.
Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield, Ohio
Roberts & Schaefer Co., 130 N. Wells St., Chicago 6, Ill.
Robertshaw-Fulton Controls Co., 2920 N. 4th St., Philadelphia 33, Pa.
Rockwell Mfg. Co., 400 N. Lexington Ave., Pittsburgh 8, Pa.
Rocky Mtn. Instrument Co., 1416-18th St., Denver, Colo.
Rodale Mfg. Co. Inc., Emmaus, Pa.
Roder-Blackburn Intl. Corp., 149 Broadway, N Y 6 N Y.
Roebling's Sons Corp., John A., 640 S. Broad St., Trenton 2, N.J.
Rogers Brothers Corp., Albion Pa.
Rogers Iron Works Co., Joplin, Mo.
Rohm & Haas Co., 712 Locust St., Philadelphia, Pa.
Roller Bearing Co. of America, Sullivan Way, West Trenton, N.J.
Rollway Bearing Co., Inc., 541 Seymour St., Syracuse, N.Y.
ROME CABLE CORP., RIDGE 56, P.O. BOX 71, ROME, N.Y.
Root & Simpson, Inc., 1310 E. 17th Ave., Denver 18, Colo.
Roots-Connersville Blower Corp., 900 W. Mount St., Connersville, Ind.
Rose Mfg. Co., 2700 West Barberry Place, Denver, Colo.
ROSS SCREEN & FEEDER CO., 100 QUIMBY ST., WESTFIELD, N.J.
Rotolite Corp., Essex St., Stirling, N.J.
Round Chain Co's., Broadway & Chainecraft Rd., Cleveland 4, Ohio
Rowan Controller Co., 2313 Homewood Ave., Baltimore 18, Md.
Ruth Co., The, 1437 Blake St., Denver 2, Colo.
Ryerson, Joseph T. & Son, Inc., 2558 W. 16th St., Chicago 8, Ill.

S

Safety Clothing & Equip. Co., 1990 E. 40 St., Cleveland, Ohio
Safety Fire Extinguisher Co., 293 Seventh St., N.Y. 1, N.Y.
Safety First Supply Co., 425 Magee St., Pittsburgh 19, Pa.
Sahara Oil Co., 25 E. Main St., DuQuoin, Ill.
Salem Tool Co., 767 S. Ellsworth Ave., Salem, Ohio
Sanford-Day Iron Wks., Inc., Dale Ave., Box 1511, Knoxville, Tenn.
SANTA FE TANK DIV., FLOUR PRODUCTS CO., P.O. BOX 510, WHITTIER, CALIF.
Saracco Tank & Welding Co., 141 S. Maple Ave., So. San Francisco, Calif.
Sarco Co., Inc., 350 Fifth Ave., N.Y. 1, N.Y.
SAUERMAN BROS., INC., 635 S. 28TH AVE., BELLWOOD, ILL.
Saylor Electric Prod. Corp., 277 Pierce St., Birmingham, Mich.
Scandinavian Ore Tankers, Public Ledger Bldg., Philadelphia 6, Pa.
SCHAFFER POIDOMETER CO., 2828-SMALLMAN ST., PITTSBURGH 22, PA.
Schield Bantam Co., Park St., Waverly, Iowa
Schneider Mfg. Corp., 316 N. Franklin St., Muncie, Ind.
Schoonmaker Co. Inc., P. G., Box 516, Sausalito, Calif.
Schramm Inc., West Chester, Pa.
SCHROTER & LOCKWOOD, 3515 SUNSET BLVD., LOS ANGELES 26, CALIF.
Schwartz Mfg. Co., Lester Prairie, Minn.
Scott's Concentrators, P.O. Box 211, Fair Oaks, Calif.
Screen Equip. Co., Inc., Buffalo 25, N.Y.
Seismograph Service Corp., P.O. Box 1590, Tulsa 1, Okla.
Sepor Microsplitter Supply, Box 645, Panama City, Florida
Service Supply Corp., 20th & Erie Ave., Philadelphia 32, Pa
SHAFT & DEVEL. MACH. CO. 808 NEWHOUSE BLDG., SALT LAKE CITY, UTAH
Sharples Chemicals Inc., 1100 Widener Bldg., Philadelphia 7, Pa.
Shawinigan Prod. Corp., 350 5th Ave., N.Y. 1, N.Y.
Shedwick, Jr., Wm. J., Reforma 20-302; Mexico 1, D. F.
SHEFFIELD STEEL DIV., ARMCO STEEL CORP., SHEFFIELD STATION, KANSAS CITY 25, MO.
Shell Oil Co., 50 W. 50th St., New York 20, N.Y.
Shepard Niles Crane & Hoist Corp., Schuyler Ave., Montour Falls, N.Y.
Sheppard Co. R H Hanover, Pa.
SHERMAN HOWARD P., W. 2404 UPTON AVE., SPOKANE 13, WASH.
Signal Engr. & Mfg. Co., Long Branch, N.J.
Silent Glow Oil Burner Corp., 850 Windsor St., Hartford, Conn
Silver Engineering Works, Inc., 3315 Blake St., Denver, Colo.
SIMPLEX WIRE & CABLE CO., 79 SIDNEY ST., CAMBRIDGE 39, MASS.
Simplicity Engineering Co., 309 Oak St., Durand, Mich.
Sinclair Refining Co., 600 Fifth Ave., N.Y. 20, N.Y.
SKF Industries, Inc., Front St & Erie Ave., P. O. Box 6731 Philadelphia 32, Pa.
SKOOKUM CO., INC., 8504 N. CRAWFORD ST., PORTLAND 3, ORE.
Sloan, DBA & Associates, 1175 Riveria Dr., Pasadena, Calif.
SMERCHANSKI, MARK G., 411 CHILDS BLDG., WINNIPEG, MANITOBA
SMIDTH & CO., F. L., 11 WEST 42 ST., NEW YORK 36, N.Y.
SMIT & CO., INC., ANTON, 333 WEST 52ND ST., NEW YORK 19, N.Y.
Smit & Sons, Inc., J. K., Murray Hill, New Jersey
SMITH-EMERY CO., 781 EAST WASHINGTON BLVD., LOS ANGELES 21, CALIF.
Smith Engineering Works, 532 E. Capitol Drive, Milwaukee 12, Wis.
Smith Welding Equipment Corp., 2633-4th St. S.E., Minneapolis 14, Minn.
Snap-tite, Inc., 201 Titusville Rd., Union City, Pa.
Snell Inc., Foster D., 29 West 15th St., New York 11, N.Y.
Snyders Mine & Chem Laboratories, P. O. Box 212, Main St., Richland, Ore.
Socony-Vacuum Oil Co., 26 Broadway, New York 4, N.Y.
Sonneborn Sons, Inc., L., 300 4th Ave., New York 10, N.Y.
Sorgel Electric Co., National Ave., Milwaukee, Wis.
Soule Steel Co., 1750 Army St., San Francisco, Calif.
Southern Carbon Brush Co., Inc., 7 S.W. 18th St., Birmingham 1, Ala.
SOUTHWESTERN ENGINEERING CO., 4800 SANTA FE AVE., LOS ANGELES 58, CALIF.
Southern Friction Materials Co., PO Box 1475, Charlotte 1, N C.
SPANG & CO., ETNA ST., P.O. BOX 751, BUTLER, PA.
Spencer Turbine Co., 456 New Park Ave., Hartford 6, Conn.
SPRAGUE & HENWOOD, INC., BOX 446, SCRANTON 2, PA.
Spraying Systems Co., Bellwood, Illinois
St. Clair, John Q., 439½ Main St., Grand Junction, Colo.
St. Regis Paper Co., 230 Park Ave., N.Y. 17, N.Y.
STANCO MFG. & SALES, INC., 1931 PONTIUS ST., LOS ANGELES, CALIF.
Standard Electric Mfg. Co., Inc., Haddon Ave., West Berlin, N.J.
STANDARD OIL CO. OF CALIF., 225 BUSH ST., SAN FRANCISCO, CALIF.
Standard Oil Co. of Ind., 910 South Michigan, Chicago, Ill.
STANDARD STEEL CORP., 5031 BOYLE AVE., LOS ANGELES 58, CALIF.
Standard Transformer Co., The, 121 Dana St., Warren, Ohio.
Staplex Co., The, 777 Fifth Ave., Brooklyn, N.Y.
Star Expansion Pacific, Inc., 142 Liberty St., N.Y. 6, N.Y.
Star-Kimble Motor Div.—see Miehle-Goss-Dexter, Inc.
Star Wire Screen & Iron Works, Inc., 2515 San Fernando Road, Los Angeles 65, Calif.
Stearns Magnetic Products, 685 S. 28th St., Milwaukee 46, Wis.
STEARNS ROGER MFG. CO., 660 BANNOCK ST., DENVER, COLO.
STEPHENS-ADAMSON MFG. CO., 13 RIDGEWAY AVE., AURORA, ILL.
Stephenson, Robert C., Economic Geologist, Rm. 2500, Girard Trust Bldg., Philadelphia 2, Pa.
Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.
Sterling Siren Fire Alarm Co., Inc., Rochester 8, N.Y.
Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill.
STILL & STILL, CONSULTING MNG. ENG. & GEO. P. O. BOX 1512, RM. 24, PRESCOTT, ARIZ.
Stonhard Co., Inc., 1306 Spring Garden St., Phila., Pa.
STOODY CO., 11928 EAST SLAUSON AVE., WHITTIER, CALIF.
Stowell & Co., W. H., 421 Sprague Ave., Spokane 4, Wash.
Straub Mfg. Co., Inc., 8383 Baldwin St., Oakland 21, Calif.
Stubbe, Albert, Vlotho-Weser, Western Germany
Stulz-Sickles Co., 929-939 Port Ave., Elizabeth, N.J.
Sturtevant Mill Co., 128 Clayton St., Dorchester, Boston 22, Mass.
Superior Carbon Prod., Inc., 9115 George Ave., Cleveland 5, Ohio
Superior-Lidgerwood-Mundy Corp., 1101 John Ave. Superior, Wisconsin
Sutorbilt Corp., 2008 E. Slawson Ave., Los Angeles 58, Calif.
Sutphen, Peter O., Box 58, Everetta, Pa.
Swett Iron Works, A. L., 158 Glenwood Ave., Medina, N.Y.
Swift & Co., Technical Prod. Plant, 1800 165th St., Hammond, Ind.
Symons Bros. Co., 11551 Hart St., P.O. Box 770, No. Hollywood, Calif.
SYNTRON CO., 144 LEXINGTON AVE., HOMER CITY, PA.

T

Talbot, H. I., Rm. 331, 84 State St., Boston 9, Mass.
Talcott, Inc., W.O. & M.W., Box 1307, Providence, R.I.
Tamping Bag Co., Div., Pickard Industries, Inc., 218 S. Third St., Mt. Vernon, Ill.
Taylor Forge & Pipe Works, P. O. Box 485, Chicago 90, Ill.
Taylor-Wharton Iron & Steel Co., High Bridge, N.J.
Technical Assoc., 140 W. Providencia Ave., Burbank, Calif.
TELLURIDE IRON WORKS CO., 400 MAIN AVE., DURANGO, COLO.
TENNANT, C., SONS & CO., OF N.Y., THE SINK & FLOAT DIV., 100 PARK AVE., NEW YORK 17, N.Y.
Tennessee Coal & Iron Div., U. S. Steel Corp., P. O. Box 599, Fairfield, Ala.
Texas Co., 135 E. 42nd St., New York 17, N.Y.
Texas Instruments, Inc., 6000 Lemmon Ave., Dallas, Texas
Texas Instruments, Inc. Industrial Instrumentation Div., 3609 Buffalo Speedway, Houston 6, Texas
Thermoid Co., 200 Whitehead Rd., Trenton 6, N.J.
THEW SHOVEL CO., 28TH & FULTON ST., LORAIN OHIO
Thomas Flexible Coupling Co., Main Ave. & Biddle St., Warren, Pa.

Thomas Laughlin Div., Am. Hoist & Derrick Co., 145 Fore St., Portland 6, Maine
Thompson Balance Co., 802 E. 18th Ave., Denver 18, Colo.
Thor Power Tool Co., Prudential Plaza, Chicago, Ill.
Three Point Belt Lacing, Inc., PO Box 389, Peace Dale, R.I.
Throwaway Bit Corp., 4200 N.W. Yeon Ave., Portland 10, Oregon
THUNES MEKANISKE VAERKSTED, A. S., OSLO, NORWAY
Tide Water Assoc. Oil Co., 17 Battery Place, New York 4, N.Y.
Timber Eng. Co., 1319-18th St., N. W., Washington 6, D. C.
TIMKEN ROLLER BEARING CO., THE, 1835 DUEBER AVE., S.W., CANTON, OHIO
Toledo Scale Co., Toledo 1, Ohio
Tool Steel Gear & Pinion Co., 211 Township Ave. Cincinnati 16, Ohio
Torit Mfg. Co., 287 Walnut St., St. Paul, Minn.
Torsion Balance Co., 35 Monhegan St., Clifton, N.J.
Trabon Engineering Corp., 1814 E 40th St., Cleveland, Ohio
Tracerlab Inc., 1601 Trapelo Road, Waltham 54, Mass.
Tractomotive Corp., County Line Rd., Deerfield, Ill.
TRAYLOR ENGINEERING & MFG CO., 10TH & MILL STS., ALLENTOWN, PA.
Treadwell Co., Inc., M. H., 140 Cedar St., New York 6, N. Y.
Trico Fuse Mfg. Co., 2948 N. 5th St., Milwaukee 12, Wis.
Trojan Powder Co., 17 N. 7th St., Allentown, Pa.
Trombetta Solenoid Corp., N. Milwaukee St., Milwaukee, Wis.
Truscon Steel Div., Republic Steel Corp., Albert St., Youngstown 1, Ohio
Tweco Prod., Inc., P.O. Box 666, 1450 S. Mosely, Wichita 1, Kansas
TWIN DISC CLUTCH CO., 1328 RACINE ST., RACINE, WIS.
Twining Laboratories, 2527 Fresno St., P. O. Box 1472, Fresno, Calif.
TYLER CO., THE W. S., 3615 SUPERIOR AVE., CLEVELAND 14, OHIO
Tyson Bearing Corp., Oberlin Rd., Massillon, Ohio

U

Uddeholm Co. of America, Inc., 155 East 44th St., New York 17, N.Y.
Udy, Marvin J., 546 Portage Road, Niagara Falls, N.Y.
Uhrden Inc., 508 Grant St., Dennison, Ohio
Ultra-Violet Producers, Inc., Pasadena Ave., S. Pasadena, Calif.
Ultra-Violet Products, Inc., 5114 Walnut Grove Ave., San Gabriel, Calif.
Union Bag & Paper Corp., 233 Broadway, New York 7, N.Y.
Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N.Y.
Union Carbide & Carbon Corp., Haynes Stellite Div., 725 S. Lindsay St., Kokomo, Ind
Union Carbide & Carbon Corp., Linde Air Prod. Div., 30 E. 42nd St., New York 17, N.Y.
Union Iron Works, E. 217 Montgomery, Spokane, Wash.
UNION OIL CO. OF CALIF., 617 W. 7TH ST., LOS ANGELES 17, CALIF.
Union Wire Rope Corp., 21st & Manchester Ave., Kansas City 26, Mo.
Unit Crain & Shovel Corp., 6411 W. Burnham St., Milwaukee 14, Wis.
United Geophysical Corp., Box M, Pasadena, Calif.
United States Electric Mfg. Co., 222 W. 14th St., N.Y. 11, N.Y.
U S Electrical Motors, Inc., 200 E. Slauson Ave., Box 2058, Terminal Annex, Los Angeles 54, Calif.
United States Graphite Co., Saginaw, Mich.
U. S. Hoffman Mach. Corp., 103-4th Ave., N. Y. 3, N.Y.
U S Industries, Inc., 25 Broad St., New York, N.Y
U. S. Instrument Corp., P. O. Box 33X, Charlottesville, Va.
U S Rubber Co., 1230 Ave. Americas, New York 20, N.Y.
United States Rubber Intl., 1230 Ave. Americas, N.Y. 20, N.Y.
U S Safety Service Co., 1215 McGee St., Kansas City, Mo.
U S Smelting Furnace Co., E "A" St., & I. & N Tracks, Belleville Ill
U. S. STEEL CORP., 525 WILLIAM PENN PLACE, PITTSBURGH 30, PA.
U S STEEL CORP., AMERICAN BRIDGE DIV. 525 WM. PENN PLACE, PITTSBURGH 30, PA.
U S STEEL CORP., AMERICAN STEEL & WIRE DIV., ROCKEFELLER BLDG., CLEVELAND 13, OHIO
U. S. STEEL CORP., COLUMBIA-GENEVA STEEL DIV., 120 MONTGOMERY ST., SAN FRANCISCO 6, CALIF.
U. S. STEEL EXPORT CO., 30 CHURCH ST., NEW YORK 8, N.Y.
UNITED STATES STEEL CORP., TENNESSEE COAL & IRON DIV., PO BOX 559, FAIRFIELD, ALA.
Universal Atomics, Div. of Universal Transistor Products Corp., 143 E. 49th St., N.Y. 17, N.Y.
Universal Dredge Mfg. Co., 124 Wazee Market, Denver 4, Colo.
Universal Engineering Corp., 625 C Ave., N.W. Cedar Rapids, Iowa
Universal Gear Works, Inc., 1031 E. McNichols Rd., Detroit 3, Mich.
Universal Road Mach. Co., 117 Liberty St., N.Y. 6, N.Y.
Universal Vibrating Screen Co., Deane Blvd. & St. Paul RR, Racine, Wis.
Uranium Engr. Co., 205 Colorado Ave., P.O. Box 1451, Grand Junction, Colo.
Uranium Exploration, Fidelity Bldg., Spokane 1, Wash.
Uranium Exploration, P.O. Box 223, Norwood, Colo.
Uranium Research & Devel. Co., 290 Denham Bldg., Denver, Colo.
Utah Fire Clay Co., 1078 S. First West St., P.O. Box 127, Salt Lake City, Utah
Utility Mine Equip. Co., 1010 Collingwood Rd., St. Louis 24, Mo.

V

Vale do Rio Doce Trading Co., 42 Wall St., New York 5, N.Y.
Van Waters & Rogers, Inc., 4000-1 St., Seattle 4, Wash.
VAREL DIAMOND PRODUCTS CO., 9230 DENTON DR., DALLAS 20, TEXAS
VAREL MFG. CO., 9230 DENTON DR., P.O. BOX 13146 DALLAS, TEXAS
Vascoloy-Ramet Corp., 800 Market St., Waukegan, Ill.
Victaulic Co. of America, P. O. Box 509, Elizabeth, New Jersey
Victor Equipment Co., 844 Folsom St., San Francisco 7, Calif.
Victoreen Instrument Co., 5806 Hough Ave., Cleveland 3, Ohio
Voland & Sons, Inc., P. O. Box 688, New Rochelle, N.Y.
Vulcan Electric Co., 88 Holten St., Danvers, Mass.
Vulcan Foundry Co., 4401 San Leandro St., Oakland, Calif.
Vulcan Iron Works Co., 730 S. Main St., Wilkes-Barre, Pa
VULCAN IRON WORKS CO., THE 1423 STOUT ST., DENVER, COLO.

W

Wadsworth Electric Mfg. Co., Covington, Ky.
Wagner Electric Corp., 6400 Plymouth Ave., St. Louis 14, Mo
WAH CHANG MINING CORP., WOOLWORTH BLDG., 233 BROADWAY NEW YORK 7, N.Y.
Wall Colmonoy Corp., 19345 John R St., Detroit 3, Mich.
Wall Rope Wks., Inc., 48 South St., N.Y. 5, N.Y.
Walvoord, Inc., O. W., 300 Detroit St., Denver 6, Colo.
Walworth Co., 60 E. 42nd St., N.Y. 17, N.Y.
Ward Leonard Electric Co., 115 MacQuesten Parkway South, Mount Vernon, N.Y.
Warn Mfg. Co., Inc., Box 6064, Seattle 88, Wash.
Washington Iron Works, 1520 6th Ave. S., Seattle 4, Wash.
Washington Machinery Co., 7329 East Marginal Way, Seattle 8, Wash.
Watlow Electric Mfg. Co., 1576 Ferguson Ave., St. Louis 14, Mo
Watt Car & Wheel Co., Barnesville, Ohio
Waukesha Motor Co., St. Paul Ave., Waukesha, Wis.
WEDGE WIRE CORP., WELLINGTON, OHIO
Weir Kilby Corp., 5038 Beech St., Cincinnati 12, Ohio
Wellman Co., S.K., 200 Egbert Rd., Bedford, Ohio
WELLMAN ENGINEERING CO., 7000 CENTRAL AVE., CLEVELAND 4, OHIO
Wesche Electric Co., 1622 Vine St., Cincinnati 16, Ohio
West Chester Chem. Co., Box 39, West Chester, Pa.
Western Foundry Co., 2400 S. W. Water Ave., Portland 1, Ore.
Western Gear Corp., P.O. Box 182, Lynwood, Calif.
Western Gear Corp., 417-9th Ave., So., Seattle 4, Wash.
Western Gear Corp., Pacific Gear Plant, 1035 Folsom St., San Francisco, Calif.
Western Insulated Wire Co., 2425 E. 50th St., Los Angeles 58, Calif.
Western-Knapp Engr. Co., 650-5th St., San Francisco, Calif.
WESTERN MACHINERY CO., 650-5TH ST., SAN FRANCISCO 7, CALIF.
WESTERN PRECIPITATION CORP., 1000 W. 9TH ST., LOS ANGELES 15, CALIF.
Western Radiation Lab., 1107 W. 24th St., Los Angeles 7, Calif.
WESTERN ROCK BIT MFG. CO., 552 WEST 7TH SOUTH ST., SALT LAKE CITY 4, UTAH
Westinghouse Air Brake Co., Cleveland Rock Drill Div., Cleveland, Ohio
Westinghouse Air Brake Co., Ind. Products Div., P.O. Box 36, Wilmerding, Pa.
Westinghouse Air Brake Co., Le Roi Div., 3716 W. Wisconsin Ave., Milwaukee, Wis.
Westinghouse Electric Corp., P.O. Box 868, 3 Gateway Center Ave., Pittsburgh 30, Pa.
Westinghouse Electric Corp., W. 58th St., Cleveland 2, Ohio
Westinghouse Electric Corp., Lamp Div., Bloomfield, N.J.
Westinghouse Electric Corp., Sturtevant Div., Hyde Park, Boston 36, Mass.
WESTINGHOUSE ELECTRIC INTERNAT'L CO., 40 WALL ST., NEW YORK 5, NEW YORK
Weston Electrical Instrument Corp., 614 Frelinghuysen Ave., Newark 5, N.J.
Westvaco Chemical Div., Food Machinery & Chem. Corp., 161 E. 42nd St., New York 17, N.Y.
Wheelabrator Corp., 620 S. Byrit St., Mishawaka, Ind.
Wheel Trueing Tool Co., 3200 W. Davison Ave., Detroit 38, Mich.
Wheelco Instrument Div., Barber-Colman Co., 1300 Rock St., Rockford, Ill.
White Instrument Co., David, 2051 N. 19th St., Milwaukee 12, Wis.
White Motor Co., 1401 Sheridan Ave., Springfield, Ohio
WHITE MOTOR CO., 1401 SHERIDAN AVE., SPRINGFIELD, OHIO
White's Electronics, 1218 Main St., Sweet Home, Ore.
WILD HEERBRUGG INSTRUMENTS, INC. MAIN & COVERT ST., PORT WASHINGTON, N. Y.
WILFLEY, A. R., & SONS, INC., P.O. BOX 2330, DENVER, COLO.
Willey, Clifford R., 2233 Grape St., Denver, 7, Colo.
Williams, I. B., & Sons, 51 Washington St., Dover, N.H.
Williams Patent Crusher & Pulveriser Co., 2701 N. Broadway, St. Louis, Mo.
Willson Products Div., Ray-O-Vac Co., 2nd & Washington Sts., Reading, Pa.
Wilmot Engineering Co., Whitehaven, Pa.
Wilson Rubber Co., Inc., The, 1209 Garfield Ave., S.W., Canton, Ohio
WINDELER, GEORGE, CO., LTD., 2201 JERROLD AVE., SAN FRANCISCO, CALIF.
Winslow Engineering & Mfg. Co., 4069 Hollis St., Oakland 8, Calif.
WINTER-WEISS CO., THE, 2201 BLAKE ST., DENVER 5, COLO.
Wire Rope Corp. of America, Inc., 609 N. 2nd St., St. Joseph, Mo.
Wisconsin Motor Corp., 1910 S. 83rd St., Milwaukee 46, Wis.
WISSER & COX, 55 NEW MONTGOMERY ST., SAN FRANCISCO, CALIF.
Witte Engine Works, Oil Well Supply Div., U S Steel Corp., 1600 Oakland, Kansas City 26, Mo.
WOLF, HARRY J., ONE PARK PLACE, NEW YORK 7, N.Y.
Wolf Safety Lamp Co. of Amer., 227 Grand Ave., Brooklyn 5, N.Y.
WOOD ASSAYING CO., HENRY, 733 W. COLFAX, DENVER 4, COLO.
Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc., Hendy Ave., Sunnyvale, Calif.
World Mining Consultants, Inc., 220 Broadway, N.Y. 38, N.Y.
World Wide Aerial Surveys (Aust.) Pty. Ltd., 52 Wentworth Ave., Mascot, Sydney, Australia
Worthington Corp., Harrison, N.J.
Wright Power Saw & Tool Corp., a div. of Thomas Industries, Inc., 410 S. 3rd St., Louisville, Ky.

XYZ

Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa.
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From advance reconnaissance to mine development...

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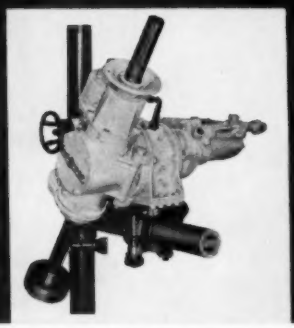
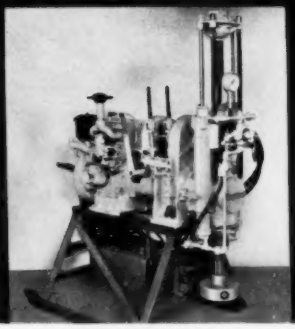
A new approach to short-hole underground core drilling, the Longyear Hi-Speed Air Leg drill requires no spraging or bracing. One man can operate with E or XRT rod to 60 feet.



PROSPECTOR HI-SPEED AIR DRILL

This powerful Longyear underground air drill is column mounted with capacity for 500' of EW rod—400' of AW rod. Other powerful column drills available.



THE LONGYEAR "24"

The "24" offers dependability and economy for mineral exploration and soil sampling. Available with screw or hydraulic head, skid or jeep mounted. Rated 750 feet of EW rod.

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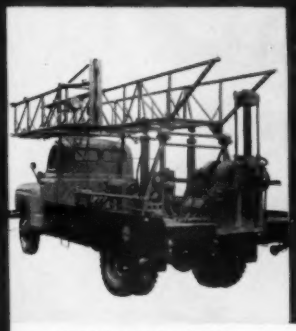
A heavy duty drill, capacity for 1250 feet of EW rod, 750 feet NW, the "Junior" is popular the world over. Available with skid mount or jeep, truck or trailer.

offer a complete service to the mining industry

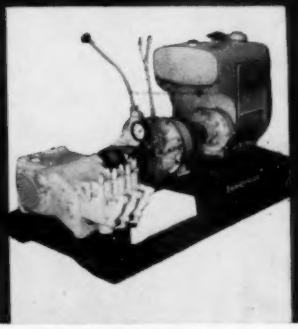


TRUCK-MOUNTED "44"

A powerful mobile drilling unit with drill and transmission pump powered by truck engine. Also available for skid and trailer mounting.

THE 314 PUMPING UNIT

One of a wide range of Longyear single speed pumps available to meet many pumping requirements. The "314" produces 14 gpm at pressures up to 300 psi.



THE 535-RQ PUMPING UNIT

Longyear transmission pumps give driller control over volume, let him drill with closed circuit at every stage. The 535-RQ has five speeds, pumps 35-4.5 gpm at pressures to 500 psi.

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More than 65 years of drilling in every type of formation contributed to the design of a complete line of diamond bits with long life for lower diamond cost per foot drilled.

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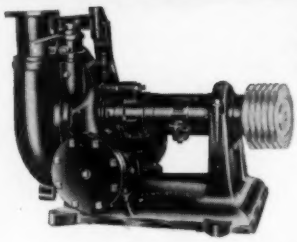
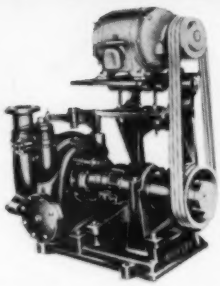
WILFLEY centrifugal PUMPS



The new patented **WILFLEY MODEL "K"** centrifugal sand pumps are designed for maintained high efficiency in rugged service and trouble-free operation. They combine the original WILFLEY principles with new improvements developed through years of engineering experience.

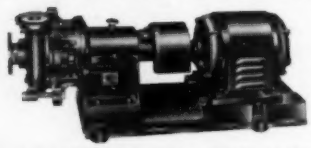


BELT DRIVEN, overhead V-belt driven and direct driven WILFLEY Model "K" pumps available in 1", 1½", 2", 2½", 3", 4", 5", 6", and 8" discharge sizes with capacities to 3000 GPM and heads as high as 200'.

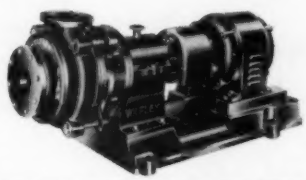
WILFLEY SAND PUMPS may be fitted with interchangeable electric furnace alloy iron or rubber covered wear parts to best meet the requirements of each pumping installation. The WILFLEY wear part design is ideal for rubber covering as ample clearance around the runner assures a practical and dependable rubber lined pump. Wherever you have a solids transfer job specify the WILFLEY Model "K" sand pump—for continuous, trouble-free performance, simple installation and stepped-up production.

Wilfley Sand Pump
"COMPANIONS IN ECONOMICAL OPERATION"
Wilfley Acid Pump

For Acids, Corrosives, Hot Liquids & Mild Abrasives



The new **WILFLEY MODEL "AF"** acid pump is famous for efficiency and dependability. Actual production-line records show worthwhile dollar savings in stepped-up performance and low-cost operation. Every day, in modern chemical plants the world over, WILFLEY Acid Pumps move hard-to-handle solutions on a trouble-free, round-the-clock schedule. Available in 5 to 2,000 GPM capacities with heads from 15 to 200' and higher.



WILFLEY "AF" PACKINGLESS Acid Pump is available with wetted pump parts of any machinable alloy as well as plastics. This versatility of materials, as well as rugged heavy-duty construction and sound mechanical design, combine with the unique WILFLEY principles to make this an ideal pump for any corrosive service.

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